Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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With the Editor

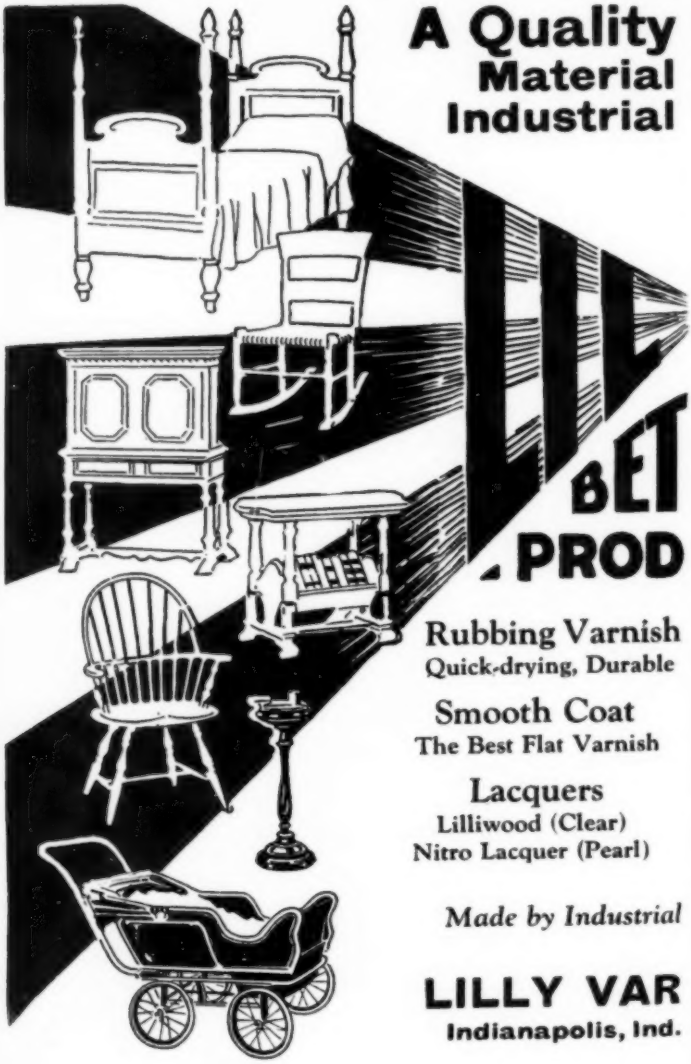
EVIDENTLY the various phases of contact between those who sell finishing materials and those who buy, have numerous elements of interest, judging from the several comments and articles that have come to this office since the subject was so ably opened up in January issue by the article, "Time Wasted in Selling and Buying Finishes," by the Assistant Pacific Coast Manager of an Eastern manufacturer of finishes. Further information on the subject was revealed in March issue by the production superintendent of a St. Louis factory—"Time Spent in Buying and Selling Finishes"—and in this issue by a Chief Chemist who submits an interesting analysis and some logical deductions, originally headed, "The Mechanism of Industry with Special Reference to Marketing," but which we felt would get more attention under the title "A Planned Policy for Balanced Sales."

These articles contain much of interest and value, and they present some practical ideas and significant suggestions for everyone—especially every executive—in the entire industry.

There is a vital difference between time wasted and time wisely spent in establishing and maintaining profitable contact between those who sell finishes and those who buy them. The most economical and effective short-cut available is the outstanding trade journal in the industry—INDUSTRIAL FINISHING. A reader's letter, which is typical and to the point, says, "I like to read it. It helps me solve my problems and tells me where I can get the best materials."

O. H. Rohr

Managing Editor



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"The future course of any business enterprise may be measured in terms of the general company policy towards matters which vitally affect such interests as reflect upon the sale of whatever products fall within the scope of its manufacture, combined with the attitude of its departmental heads and their ability to look into the future and foresee business trends, rather than to interpret from statistical data what has taken place in the past."—

Ellis W. Coates

A Planned Policy for Balanced Sales

Chief Chemist of The Federal Products Co. analyzes certain principles and problems involved in marketing industrial products and suggests how to maintain a satisfactory balance between sales activities and other factors

By Ellis W. Coates

ALL INDUSTRIAL activities may be grouped under four general headings; they are: 1—Production, 2—Marketing, 3—Accounting, and 4—Finance.

It has been well said that, "Competition is the life of trade," and in these days of mergers and amalgamations of commercial interests—hectic competition's silent spokesmen—production departments seem to have borne the brunt of attacks which had as their objectives the more economical production and sale of articles of trade.

Just why this is true need not concern us here, but it is easy to see that a saving effected in any one of the four major divisions of an industrial organization, as outlined above, would tend to boost the stock of such organization in the end—since it is the margin of profit on all the operations combined that enters into the final calculations, and not that which any one department is able to show alone.

This brings us to the point at hand, and suffice it to say that before further attempts are made to economize in the realm of production, it would seem advisable to look into the status of conditions surrounding the other branches of industry with the same purpose in view.

Sales; Purchases

Since marketing comes next in line after production and appears to fall within the purview of our intended discussion we shall attempt to confine our remarks to it and its various ramifications. As a branch of industry, it may be further subdivided into two general terms in common use—sales department and purchasing department. Obviously, a close relationship exists between these departments; they are mutually dependent upon each other when all industries are considered collectively. This being the case, it is but logical to expect the ills of either to be reflected in the other.

and ultimately upon the ledgers representing an industrial structure as a whole.

Now the purpose of marketing is easy to define. It is to sell. Its ultra-purpose—if we may so express ourselves—is to sell without undue lost motion, and at a profit. The hazards and pitfalls connected with the marketing of industrial finishing materials have recently been ably discussed by Mr. C. Dan Youngs in the January issue of INDUSTRIAL FINISHING, starting on page 54. This particular line of marketing is not radically different from the others and may well serve as a representative example.

A Marketing Campaign

The question, then, is how may an organization plan a marketing campaign so as to realize maximum benefits? The answer suggests itself in a single word—co-operation. This may be an overworked illustration, but its value becomes enhanced with use. The best interests in any line of business may be cared for better by trained men who are accustomed to thinking in terms of team work rather than in terms of individual play.

Departmental heads should be chosen with this in mind, and the system should be extended to include all purchasing agents, and sales managers, as well as the key men who work under them. If we are to avoid the time lost in buying and selling and the twisting of information through excessive transmission, from a purchasing agent on down the line to a foreman finisher, as brought out by Mr. Youngs in the article referred to above, we must employ buyers who are familiar with technicalities and who are men big enough to assume absolute responsibility for their actions. They must be able to differentiate, and thus to separate the worthwhile from the chaff.

Furthermore, the managing personnel or board of directors, as the case may be, should acquaint themselves with the duties of such men, and they in turn must be able to see and realize when the respective departments for which these men are responsible are functioning properly.

It happens not infrequently that good men drift into the wrong niche in industrial organizations. This occurrence is little short of tragic when it is not corrected. It represents a gross injustice to an individual as well as a direct loss in dollars and cents to a company itself, if a man be permitted to struggle along with a position for which he is hopelessly unadapted. The man should in all cases be master of his work instead of the work dominating him. Such a condition may be adjusted in most cases by a simple shifting or transfer of personnel, a sort of juggling of men and positions in order to obtain the desired end.

Character and personality are intangible but they are a part of each individual, and are not ours to alter at will. It is comparatively easy however to fit the man to the job, and this should be done promptly. It is by far the kindest treatment for all concerned when all angles of the case have been viewed through the eyes of retrospect, and the economy involved is by no means too small to attract attention.

The Role of Advertising

Perhaps the greatest single aid to successful sales is effective advertising. And advertising, to be effective, must be put across in an attractive manner. It has a perfectly definite message to convey,

to be sure, but it is equally true that there are many and various ways of expressing this message. It must have dash, spirit, and verve, interwoven skilfully with clarity of expression and above all, an honest portrayal of characteristics rather than disillusionment as regards quality of products. These assets constitute the acumen of the printed page which is analogous to personality in a salesman.

A word about the costs of advertising will not be out of place here. I once saw a cleverly worded treatise on this phase of the subject which proved conclusively that the men who paid for advertising were those who did not advertise. It is thought that the present status of industrial advertising, as an aid to marketing, constitutes the strongest argument toward substantiation of this point that we might offer, and we will content ourselves with this meager reference to it as we pass on to the details of how advertising functions in harmony with salesmen, and how its costs are reflected in terms of sales volume.

Any wide-awake salesman prefers to sell for an organization that does consistent advertising. It paves a way for his approach, makes it easier for him to display his wares, cuts the calling time to a minimum, and increases his volume of business. But how does advertising do these things, we ask? In the last analysis, it is not advertising that does them, but psychology instead.

Advertising is the medium through which these ends are attained, because it puts the prospective buyer's mind in a receptive mood. A salesman's call at a psychological moment turns the trick.

The Buyer's Market

Just as advertising is the salesman's greatest asset, the "Buyer's Market" is his greatest liability. It is significant that a sales organization is not responsible for this condition, nor has it any sure way of exerting control over it. The responsibility rests, in this case, with the leaders of industrial trade associations. It is one of their purposes to prevent an overstocking of the commodities in which their members are mutually interested.

However, this purpose is not always accomplished, and as a consequence, the market becomes flooded and prices slide to a lower level. The sales force goes into a slump, which is little short of demoralizing in its influence. This condition should be met squarely by bringing all available pressure to bear which is at the command of the industry so afflicted. Production should be curtailed, advertising space increased, and above all, the sales organization should be made to feel that it will be supported to the last ditch by the other departments.

A return to normalcy by the way of the shortest route may only thus be assured, while at the same time the morale of the sales department need not be shattered by the childish "I told you so" attitude of its sister departments.

If a plan could be devised and put into operation which would insure a sales force that its field of activities would at no time be marred and hampered by the appearance of over-production, with its attendant ills, then a forward step would have been taken in the march which would ultimately rout the demon *waste* from our buying and selling programs. As indicated above, this is management's outstanding problem, and

the economy to be effected awaits a proper solution.

Two Factors to Balance

Briefly summarizing these remarks, we may list Advertising and Buyer's Markets as the two factors which exert the greatest and most divergent influence upon the structure of industry from the standpoint of marketing. The good effects of the one must be made to offset the ill effects of the other before a sales department may begin to be guided by the light of success.

To accomplish this goal, it requires the good will and support of all dependent branches of industry, plus intelligent application of their reserve forces. These may only be assembled under one banner by superb leadership, an attribute that is closely akin to inspiration.

A Perfect Non-Bleeding Red

Lacquer finishers in all industrial lines today are in need of a perfect non-bleeding red. It is a thing that has been long sought and hoped for but, as yet, no such red has become known—so far as I can learn.

Reds are used considerably in tinting and mixing colors; they are often used in color schemes. The finisher must be careful how he uses red in color schemes because of the danger of bleeding. This, of course, kills a lot of time.

Here is an example of where a non-bleeding red is necessary. Say an article is to be made red, and a cream trim is required; this is hard to do because the red will bleed through the cream. For another example, let's take a red panel that is to have a stencil of ivory and a light green; the ivory will turn a blotched pink and the green will turn partly reddish brown.

It is hoped that some lacquer manufacturer will soon develop and come out with such a red as we desire. Let's hope that this will be a hint to the manufacturers, and that we get some action. —Joseph M. Verderosa.

Cadmopone, a bright lemon yellow pigment, is made by substituting cadmium instead of zinc in lithopone. It is heat resistant, fast to light and grinds well in lacquer dopes and varnishes. By varying the amount of cadmium it can be made in shades of orange, red, crimson, and maroon.

New Finish "Lac"

E. T. Stille & Co., Chicago, announces a new universal "Finishing Lac No. 300" which is said to combine the qualities of shellac, lacquer and quick-drying varnish. According to the manufacturer this material can be used as an undercoater for any finish, and is also recommended for final finishing. It is claimed to be as tough as lacquer, and can be sprayed, brushed or dipped with equal results.

New Spray Booth Coating

The Geo. L. Williams Co. of Cleveland, Ohio, has the following to say regarding the use of its new product which has been named "Wilco Spray Booth Coating."

After the walls of spray booths have been cleaned, they should be covered with a coating upon which the residue of painting for the day will be deposited. Wilco spray booth coating can be removed with lacquers and other residues by the application of hot water with an ordinary garden hose, by the application of steam, or it can be peeled down with a wooden straight-edge scraper.

"This new coating is a liquid which does not break down or settle out, and it needs no stirring or agitating. It can be applied with regular air equipment—with any make of spray gun—or it can be applied with an ordinary paint brush."

Finishing Wood Steering Wheels

Production Manager of Steering Wheel Division at Larkin-Dayton Co., calls attention to the severe service to which steering wheels are subjected and outlines in detail the finishing methods and materials used by this concern

By Frank V. Tischer

THERE is probably no piece of woodwork put to more abuse than a steering wheel in service. In driving, the hands are always upon it—often gripping it tightly—and when the finish is poor it will soon rub off. The clacking of buttons, buckles, jewelry, etc. is also injurious to the finish. Therefore, it will be readily understood why a steering wheel finish should be superior in comparison to the finish on other woodwork, to avoid disfiguration or rubbing off in a short time.

Cut at top of this page shows a view in the experimental department.

Durable Lacquer Finish

A durable finish for steering wheels does not depend upon skill in application alone; there must be a chemical affinity which binds the wood fibers and the lacquer finish applied to them. For instance, if grease is applied to wood fibers and lacquer is put on, the lacquer will not bind with the wood fibers; as a result it can be peeled off with ease.

A good foundation for a tough and durable finish, that will bind with lacquer, is produced by a chemical change in the wood pores, effected by a substance containing water capable of driving

out the objectionable gases under the influence of gentle heat, and leaving the wood surface smooth, hard and oil-less, and the wood pores closed up. The substance having an affinity for lacquer solvent, acts upon it, neutralizing same to a great extent into an odorless, volatile compound; and when the lacquer-solvent evaporates, the lacquer unites with the wood fibers and the substance. The substance I refer to is called ———.* Below is our schedule of finishing operations from the glued-up stock to the finished steering wheel for the market:

Stock machined.
Sanded with No. 3 sandcloth.
Dipped in ———*
Dried at 100-deg. F. ½ hour.
Slightly touched up with No. ½ sandcloth.
Dipped in lacquer at 15-minute intervals.

The finish on our steering wheels is smooth and pleasing—very clear and very tough. When dissected it will take the wood fibers along with the finish. In actual service a two-year wear has not shown any deterioration of the finish. The two chief points in successful manufacture of woodwork lie in the proper gluing up of stock and the chemical affinity of binding the wood fibers with the finish.

*Name on request.

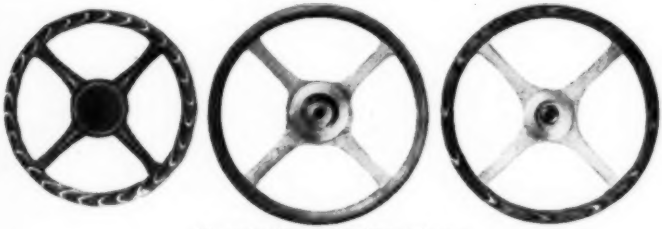
Causes of Poor Finish

It has been the custom for many years to use oily filler for filling wood pores. As mentioned above, grease and lacquer make a poor combination for a good finish. When the writer entered the finishing field some 30 years ago, it was the custom to use, as a filler, a mixture of corn starch and boiled linseed oil to which some coloring matter was added. Later, the corn starch was succeeded by chalk; and now silex, etc.

Such a filler is very good under varnish for a time but, according to our experience, it does break up in years—for reasons not very well understood. Filler made up of starch, chalk or silex, etc., with oil and used under lacquer, when not dried for a long period of time, will produce ill effects in the finishing room almost immediately after the application of two or more coats of lacquer.

A thin coat of shellac under one of lacquer seems to do well enough, but when subjected to a test by running a putty knife over the finish, it can be proved the shellac was prevented by the lacquer from binding with the wood fibers. However, when two or more coats of lacquer are applied over shellac in succession, the surface will check up and become worthless.

The use of benzine, gasoline or



Wood steering wheels of latest design.

any such a hydro-carbon for undercoat of lacquer is not so good; in favorable weather it does fairly well, but in damp weather it causes the lacquer to check and turn white. In an even-heated temperature, it causes the loss of luster—the wood looks dead—it does not bind well with the wood fibers and lacquer unless dried for a long time, which is prohibitive in production. The use of strong acids under lacquer for chemical binding serves well, but makes the finish brittle; when struck with a blow the lacquer will chip off.

Lacquer is Proper Finish

Lacquer in itself, when properly used is highly advisable for all finishing purposes and does accomplish all that the lacquer manufacturers claim for it. The writer investigated the various objections laid to lacquer. Remember, the lacquer is one thing and the lacquered finish is another.

In finishing 3500 all-wood steering wheels in every weather condition and temperature, we are of the opinion that the troubles are in the conditions and admixtures—either in undercoating or reducer of lacquer—and not in the lacquer as made by the manufacturers. When the proper undercoating is found and applied under lacquer, the lacquer will appear bright, lustrous and tough.

Furniture Finished Better

Perhaps one of the reasons why there is still much to be desired in the quality of some of the modern finishes, is that manufacturers, whose goods require some kind of a finish, do not know how much money to spend in this way.

It is true that a manufacturer of cheap porch furniture need not spend nearly as much time and money on his finish as the manufacturer of high-grade dining room furniture.

It is a significant fact that manufacturers today are realizing more than ever before just how really important it is to have their goods attractively finished. The 100th Grand Rapids Furniture Market gave evidence to this plainly, and we who are interested in seeing the entire finishing industry put into the prominent place where it belongs, were glad to note that quality finish is being emphasized more than ever before.

Many manufacturers, who realize that it does not prove a wise policy to skimp on finishing costs, are realizing increased sales in their product. The improved finish deserves credit for the increase.—J. C. H., Jr.

Perhaps the most striking aspect of the use of labor-saving machinery is the quality or the character of the work that can be performed, and this brings in its train, results that are a benefit both to the worker himself, and to the ultimate consumer.

Cleans Finishers' Hands

The Teggo Mfg. Co., of Chicago, announces a new compound called "Teggo," which is said to be particularly useful for cleaning the hands of all stains from or coatings of finishing materials. It is a creamy white paste which is rubbed into the hands before starting to work. It penetrates the pores of the skin where its antiseptic, germicidal properties prevent skin diseases from orginating in case of minor abrasions.

It leaves a protecting film over the skin, and no matter how stained or dirty the hands become, they can be washed clean with common soap and water. The material is put up in convenient tubes.

"Here is a short article on lacquer fires. We had the misfortune to experience a fire of this nature and I believe some of our experience will be beneficial to others."—F. W. Purdon.

Lacquer Booth Fires—Causes; Prevention

Superintendent of finishing, at a large furniture factory, relates some valuable facts about lacquer fire hazards, and tells what may cause lacquer fires, how to prevent them and how to fight them

By F. W. Purdon

THERE are many who are using lacquer in the finishing of wood every day who may be benefited to some extent and who would profit by the experience of others, by knowing something of the nature of lacquer booth fires —the hazards and the means of prevention.

Before going into the details of this item, a word here may not be amiss on proper housekeeping where lacquer is in constant use. Much has been written on this subject, but I believe not enough; neither has there been enough foresight among the users of this highly inflammable material to insure absolute safety from fire hazards.

Lacquer, as made today, is without doubt the most inflammable of finishing materials used, and it would pay every foreman finisher and manufacturer to use all precautions possible to minimize the hazard of fire which is connected with lacquer.

I do not wish to unnecessarily frighten the users of lacquer, but I do believe the facts should be seen as they are—that is the difficulties found in combating a lacquer fire.

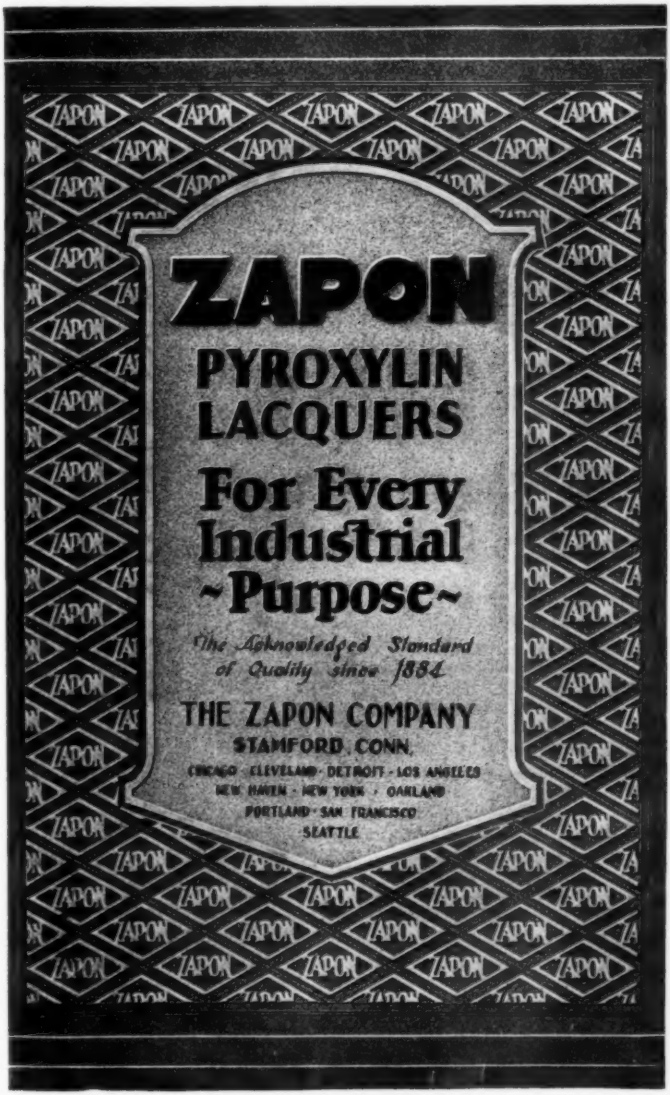
With proper housekeeping, there is no greater danger connected with lacquer than with any other inflammable material in use in all finishing rooms. However, a little carelessness may easily result in a serious fire. Take, for instance, a filler rag thrown carelessly behind some piece of work, or left lying over night.

Filler liquid base is linseed oil and spontaneous combustion occurs very quickly if the rag is kept from air. A burning-in alcohol lamp,unextinguished at night, is also a great danger. Many very serious fires have had one of these origins and many other causes could be mentioned.

Adequate Ventilation

All lacquer rooms, large or small, should by all means have proper ventilation. Without good ventilation we find the first fire hazard in lacquer. Lacquer fumes, when mixed with the correct amount of oxygen, are very explosive—more so than gasoline. Therefore, ventilation is the means of overcoming the greatest danger from fire.

A spark will cause the fumes of lacquer to explode. This spark may be created in a number of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ways, such as sparks from a motor not grounded properly, a static spark from a belt, or a spark from the steel wheels of trucks striking on nails in the floor, or sparks from spuds or steel shovels used in cleaning the floor of the booth. Keep this in mind: Ventilation is the means to overcome this hazard. From much experimental work along these lines I have found that lacquer fumes are all that you need to guard against from sparks.

What Tests Revealed

Lacquer dust will not ignite from a spark; neither have I ever been able to ignite it with a spark. I have tried to ignite lacquer dust with an electric arc, using wires carrying 110 volts of electricity and making an arc or short circuit under and around a small pile of lacquer dust, but this did not do it. I have run a stream of sparks from a piece of steel held on an emery wheel for ten minutes, and this did not ignite it, yet it gave me the same spark that would be caused from steel shovels or spuds used on or around a machine in cleaning. Do not misunderstand me! I have not cited the above experiments to influence you to be careless, but use more caution as there is always a "first time."

Now, if you will take a match, light it, let it burn until you have a very hot charged end, blow it out and lay it on a small quantity of lacquer dust, this will cause it to fuse. It will fuse slowly and give off intense heat with very black dense smoke, but will not flame.

Again, take another small quantity of the dust, touch it with the flame of a match and you will see it burst into flame very quickly.

You say: "Who would be foolish enough to touch a match to a lacquer booth?" Well, I want you to know that these things will happen and did happen to one of our large spray booths—but in a little different manner. I will relate the facts shortly.

Many Precautions, but—

After adopting lacquer as our finish some four years ago, we began to install every safety device that we thought necessary to safeguard our machines, among which were vapor-proof drum lights. The workmen, millwright, electrician, plumbers, carpenters, etc., had all been schooled in the fire hazard of lacquer, but during the installation of the vapor-proof lights on the lacquer machine, a new man—an electrician's helper—was working, who had not had this schooling in regard to the fire hazard of lacquer.

To make a good connection with the electric wires, he decided to solder them, and in the absence of all the others he lighted a small blowtorch for this purpose. The torch flame came in contact with the front top edge of the booth and quicker than it takes to tell it, the whole machine was enveloped in a mass of flame. The electrician's helper was singed with the first burst of flame and had a narrow escape with his life.

Our Lacquer Fire

In a few seconds workmen had fire extinguishers in operation, but the heat was so intense it was impossible to get near enough to combat the flames. Other workmen put several lines of hose into action, but in a very few minutes they were obliged to withdraw on account of the gas and dense smoke coming from the lacquer.

Here is the next hazard you must make provision for, if you

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are to fight a lacquer fire. The smoke from the burning booth, in about ten minutes, made the room as black as the darkest night, and this room is about 200 feet long and 75 feet wide. The heat released 22 sprinkler heads in about five to ten minutes and these saved the day, as far as the fire was concerned.

As stated before, the room was as dark as night from the dense black smoke. We could not tell whether the fire had been extinguished or was still burning, so we did not dare to shut off the sprinkler system. Here is where you need, in your protection equipment, a gas mask and a searchlight. These are not idle words; if you have no gas mask in your equipment, don't lose any time. Get one at once!

Let me say right here, you should have all of your fire extinguishers on lacquer machines work automatically. There are many fire extinguishers that may be placed to work that way. With the gas and dense smoke that comes from burning lacquer, you have no chance at all to combat the fire.

And What it Taught Us

This fire happened on the top floor of one of our five-story buildings. On the floors underneath were packing, machine and stock rooms, also offices. Water on these floors was knee deep. This, no doubt could have been avoided to some extent if we had possessed a gas mask in our equipment. Water damage is sometimes as costly as fire damage. This was true in our case. The fire was confined to the spray booth — nothing else — but the water damage took in the five floors of the entire building. The possession of a gas mask may save you many hundreds of dollars from water damage.

In conclusion, I want to leave these facts foremost in your mind. Insist on good housekeeping, have proper ventilation in the rooms where lacquer is used, have the fire extinguishers work automatically, and add to your equipment one or two gas masks.

Foremen are the real leaders of workers. They know the facts, whereas others know only what they have been told.

Worthington Moves Offices

The Executive Offices of the Wortnington Pump & Machinery Corporation, also its Export Sales Department and New York District Sales Department, has just been moved to No. 2 Park Avenue, New York City.

As a part of a program to improve the efficiency of its service, Worthington has moved its Head Office Sales and Advertising Departments ration, located at 421 Worthington to the Harrison plant of the Corpo- Ave., Harrison, N. J. The plant is located alongside the Manhattan Transfer Station of the Pennsylvania R. R. and is served by tube trains of the Hudson and Manhattan R. R., as well as local trains of the Lackawanna R. R. to Harrison.

Shellac Decision

According to a report dated March 26, from Edmond A. Whittier, secretary-treasurer of the American Fair Trade Association, 71 West 23rd St., New York, the Court of Special Sessions has decided that it is illegal for any manufacturer to label his product as "shellac" if it contains any ingredients other than the gum-like substance produced by an industrious insect of India called Tachardia Lacca.

The American Bleached Shellac Manufacturer's Association is trying to enforce the standards for shellac adopted several years ago by all the large associations of paint and varnish manufacturers and dealers. This standard provides that the term "shellac," on labels and advertising, means only a shellac gum cut and dissolved in alcohol. The action was brought under section 421 of the Penal Law against faulty advertising, known as the "Printers' Ink Statute," which is now enforced in about 40 different states.

Discrimination!

Superintendents & Finishing Foremen:

Your intimate knowledge of the needs and requirements of your manufactured product enables you to use discrimination in selecting, testing, and ordering the right finishing material. We ask you to test and try

Roxalin Flexible Lacquer

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PERMANENT ADHESION

"Clear Lacquer 1510" and "Lacquer Enamels 1510" (in all colors) can be stamped and drawn without flaking or peeling; gives glass-like hardness; enduring toughness; takes a high buff easily.

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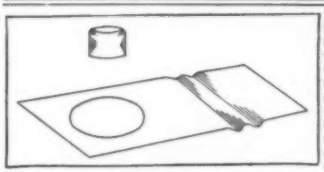


Brass sheet, *first* lacquered *then* stamped and drawn.

Gentlemen:

Kindly send brass sample as illustrated, so we can test it for permanent adhesion and flexibility.

Name .....

Firm .....

Address .....

"This will be the first of a series of articles which will discuss finishes of various pieces of low and medium priced furniture, and will compare the finishes of these pieces as they are today, with their predecessors."—

Development of Designed Finishes for Furniture

Consulting designer reviews the development of furniture during early period designs when finish was a minor consideration and points out how today, finish and color are of first importance in the design of new pieces and new suites

By Leo A. Jiranek

IT is interesting to note the way furniture finishing has gained its end in the importance of furniture manufacturing. Going back to the first furniture it appears that no finish was used; there was nothing to preserve the wood from weather and wear. The soft mellow colors that are greatly admired in our antiques have become so colored by age.

Walnut was for a long time the chief wood from which furniture was made. No finish was used on this wood for many years, and the story goes that the people of early times noticed that grease from food dripping on the dining tables was rubbed in, and a nice gloss resulted. From then on the furniture was rubbed with grease, and later with oil and beeswax. Still later a varnish was discovered, made by dissolving gum copal in boiling oil.

William and Mary

At the time of William and Mary the usual treatment of furniture was, first, an application of white gum shellac dissolved in alcohol, brushed on in thin coats and finally rubbed with beeswax and turpentine. It has been noticed that under certain conditions, the wood that received an application of shellac was frequently attacked by worms.

This same finish was used in England up to and through the Georgian Period. Until this time no mention has been made of any stain, the wood being left in its natural state—the beauty of the grain being unimpaired in any way. But while Sheraton used practically the same method, to obtain a reddish color, a little alkanet root in a cheesecloth bag might be suspended in the mixture of beeswax and turpentine for a little while.

The French polished their furniture with shellac, and imparted a very lasting and high finish, but they were apt to give too many coats of varnish, thereby dulling the grain of the wood.

The use of root and berry stain was the only kind known for a long time, but as the world progressed, the knowledge and discoveries of new stains and finishes developed along with it.

Now there are many finish manufacturing companies, all competing with each other; this competition, of course, is an incentive to find new and original finishes. At the present time lacquer is rapidly gaining favor in many factories.

Style in Form Only

Furniture was formerly sold entirely on its design; finish did not enter into the proposition. If it was well designed, that was enough; but now we see more and more how necessary a good finish is. Most of the furniture is taken from a certain number of established and recognized styles and, to obtain a more original result, much stress must be laid on some finish which will make one suite different, more striking or more attractive than the other.

In regard to finish, furniture can readily be compared with automobiles. When the automobile was less common and not developed into such a mechanically perfect machine, the prospective buyer took great interest in the motor, making a thorough examination of all the minute details before even considering buying a car, but now he scarcely looks at the motor; he is interested only in a good, attractive "paint job," having taken it for granted that the motor has reached the point where little improvement can be made.

So it is with furniture. While formerly it was sold on construction and style, now that the changing of style is not so outstanding, it is color that adds to its distinction today. We are living in an age of color; it is shown in our clothes, our homes, our automobiles, and it is following along closely in our furniture.

As has been mentioned, most of our furniture for a long time has been more or less a copy of some definite style and, as it is a copy, finishers have endeavored to get as much of a likeness as possible to the old pieces. This old furniture, having little or no finish, naturally darkened with age and was lighter in the high places, showing wear. In our reproductions and even in furniture that was of an original style, the same effect was obtained by high-lighting and shading, this shading in some cases being so dark that the wood looked burned.

Photo Courtesy of John Widdicomb Co., Grand Rapids.

At the January Market

But it was observed at the January Market this year, that we are gradually working to a softer tendency and a blending of colors, lighter finishes to show the wood grain, and a contrast in woods. Here is seen the influence that Art Moderne has had on present-day furniture; it is of a type that deals with the treatment of contrasting woods, and the pleasing effect gained by the combinations of color in the various woods which compose one piece of furniture. No shading is used and, in most cases, a very natural finish shows off the grain of the wood to advantage.

It is noticed now in the finishing world that a very different method is being used in the factories to obtain ideas for the finish. When it was considered a minor detail, it was left to the foreman finisher to work out a finish according to his own ideas. But now the manufacturer has at last begun to realize what an important thing the finish is, and he discusses it in detail with the designer and even with color experts. He is convinced that design alone will not sell his furniture. Finish has become an item of importance in the manufacture of furniture.

Varnish Industry

The varnish industry as a manufacturing institution, in spite of its early use by individuals, is a very young one. Prior to the eighteenth century it was customary for each man to make small batches of varnish as the need arose, according to recipes handed down from father to son.

Sometimes the varnish maker would travel from place to place making and applying small batches of varnish for those who desired it. The first varnish factory was established in 1790 in England and within the next 25 years factories were also established in France and Germany.

With the passing years and the ever-increasing use of varnishes, not only as clear protective coatings but also in the manufacture of paints and enamels, many changes in the methods of manufacture, as well as in the raw materials used, have been made.

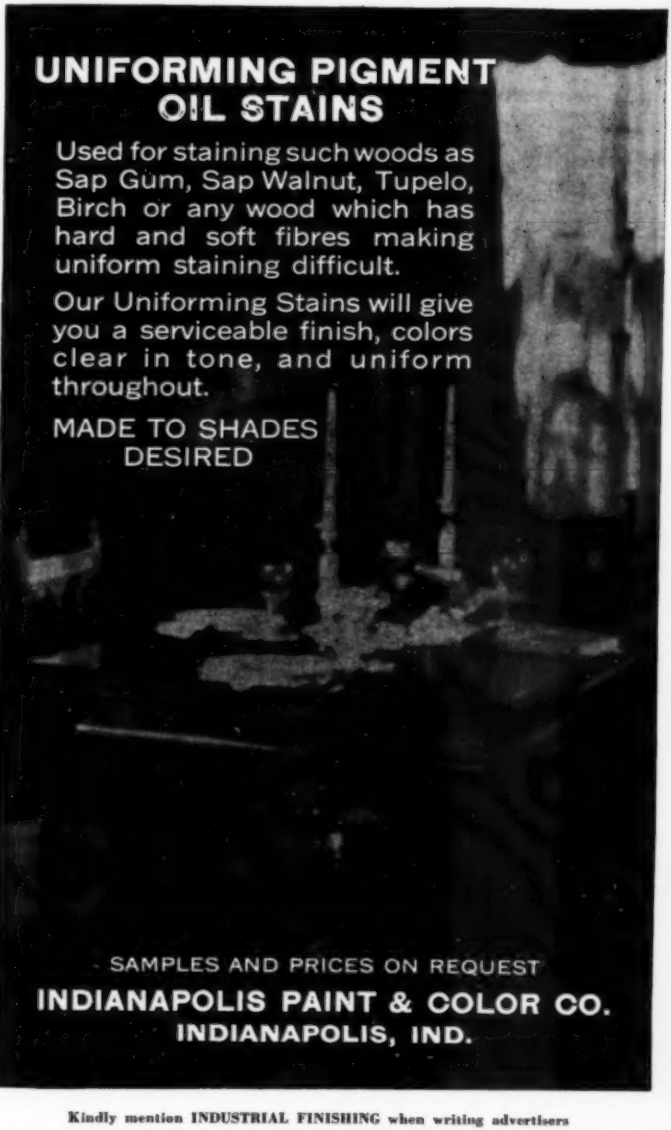
Today there are large varnish making plants where hundreds of pounds of gums are melted in one kettle and thousands of gallons of varnish are sorted in huge tanks and allowed to age against the time when it will be used to protect and beautify furniture, pianos, interior woodwork, etc.—C. E. W.

Some of the unsatisfactory spray work is due, not to poor gun handling, but to failure on the part of users to maintain the spray equipment in proper condition.

All material, fluid and other containers should be kept perfectly clean, as should also the guns, the air and material hose.

Duco in Europe

According to an announcement by the E. I. duPont de Nemours & Co. two factories in Europe are now manufacturing Duco, and a third is being constructed and will be in operation in a short time. The Society Francaise Duco has a plant for the manufacture of Duco at Stains near Paris. This plant has just started operations. There is another plant for the manufacture of Duco in England and a company named 'Duco Societa Italiana' has been formed and is constructing a plant about 12 miles from Turin, Italy. This will be in production shortly.


UNIFORMING PIGMENT OIL STAINS
Used for staining such woods as Sap Gum, Sap Walnut, Tupelo, Birch or any wood which has hard and soft fibres making uniform staining difficult.
Our Uniforming Stains will give you a serviceable finish, colors clear in tone, and uniform throughout.
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SAMPLES AND PRICES ON REQUEST
INDIANAPOLIS PAINT & COLOR CO.
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Pressed Metal Finishing

Dip Cleaning and Dip Finishing

Finishing production engineer calls attention to some interesting and economical equipment for use in dip cleaning, dip finishing, transferring and air drying pressed metal parts

By Wm. S. Lyhne

TO MEET the demand for greater production per dollar expended for direct labor, is the problem that concerns the management of many manufacturing firms, for while executives may know of several ways of increasing production, the tremendous expense involved often prohibits carrying out their ideas.

In trips through many plants I have found that one of the most neglected departments, and yet one of the most important of all, is where finishing is done. Today, the finishing of practically every manufactured product is highly important, regardless of the type of finish used; as one advertiser aptly puts it in this magazine, "The last touch you give it is the first thing buyers see."

Perhaps it is because all finishing work is apt to make a room dirty and messy, that the natural inclination of some managers is to put the department in the most unsuitable place or corner of the factory. Then, to make matters worse, the most inefficient makeshifts are sometimes used to do the work.

It is with the thought of aiding those concerns who have a great deal of finishing but not sufficient capital or steady demand of product to warrant putting in an elaborate finishing outfit, that prompts me to give the following description of a system I have installed several times, with a minimum outlay of money. Please remember it is being described as using a certain type of product, and that another company would probably have to make changes to suits its particular needs in size and shape of products, type of finish, volume of output, etc.

The Cleaning Tanks

First, having in mind pressed steel articles to be enameled, there is the question of cleaning. In one of the latest installations I have in mind, we have for this operation, three tanks in a row placed the narrow way, end to end. The first tank contains the cleaning solution. The tank is 10-ft. long, 3-ft. wide and 2½-ft. deep; it is made of sheet steel, welded together at the joints, and has a flange around the top edge. No trouble need be feared from rusting, owing to the nature of the cleaning compound.

This cleaning tank is heated with a steam coil placed within and at one side of the tank; the steam line enters at the top and leaves through the end at the bottom. If one expects heating results, he should not extend the steam pipe (through which steam leaves the coil) out over the top edge of the tank—as so many have done and failed to get results. The idea of putting the steam coils to one side of the tank is to force the dirt and scum

Pee Gee

Q.D.V. CLEAR VARNISH

A free flowing full bodied clear varnish. Light in color. Dries ready for the second coat in four hours.

For all kinds of furniture, interior and exterior woodwork. Ready for rubbing in six hours. Waterproof.

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over to the other edge as the solution boils, thereby leaving a wide clean space through which to draw out the articles being cleaned.

Our method is to have the workmen always begin by putting the articles to be cleaned in one end of the tank; then, by the time they have it filled to the other end, the first pieces in are ready to be taken out. When extra good cleaning is required it is well to have an arrangement whereby a current of electricity is turned on while the pieces are in the cleaning solution.

The second tank is for a cold water rinse; it is 3-ft. long, 3-ft. wide, and 2½-ft. deep, made as the other. A drain board, placed between this tank and the cleaner tank, is inclined toward the cleaner tank so as not to waste or weaken the cleaning solution.

The third tank contains clean hot water, and is used for the dual purpose of a second rinse and to thoroughly heat the metal so as to quickly dry the articles being cleaned. This tank is 5-ft. long, 3-ft. wide and 2½-ft. deep, made as the other two.

The cleaning room is 28-ft. square, and what area is not occupied by the tanks and the necessary working room, is used as space in which to pile the articles while they are drying and awaiting the painters. The floor is on a slight incline and is waterproof. Room should always be provided on both sides of each tank, so as to permit a man to stand on each side, when lifting things out of the tanks. This cleaning room is shut off from the paint room so that moisture from steam in the air, will not enter the paint room, possibly causing the drying process to slow up.

The method to be used in the painting and finishing department depends upon several factors; for example, the amount of room available, the type of finish used, the kind of drying system (air or oven drying), etc.

Carrier Rack Equipment

In one installation for dip finishing and air drying, equipment was erected as follows: To support portable racks or carriers which carry the freshly dipped articles, we erected straight rows of two-by-fours reaching from the floor to the roof trusses or ceiling, and spaced about 6-ft. 8-in. apart. As a matter of fact, we only extended two-by-fours to a truss at intervals of every 20-ft., leaving the two studding in between reaching only to the height of the frame work that supports angle-iron trackage to carry the portable racks.

The width of racks depends on what articles they are to carry, but 3-ft. is a good width. To the sides of these upright studs we fastened angle-iron trackage, running it horizontally, of course. These tracks can be in two, three or four rows or levels, the number of rows or levels depending on the length of the pieces to be hung from the carriers. The top row is 6-ft. from the floor, which is within easy reach of the finisher. This top track extends 6½-ft. back of where the painter stands at his dip tanks, so the front end of the carrier can be spotted directly overhead; then, as he fills it, he gradually moves it forward along the track. The arrangement is shown in the accompanying drawing.

The first 6½-ft. of space back of each dip tank is equipped with a drain board, but the next 6½-ft. of space is covered with floor drip pans. By the time the work goes

Here's How!

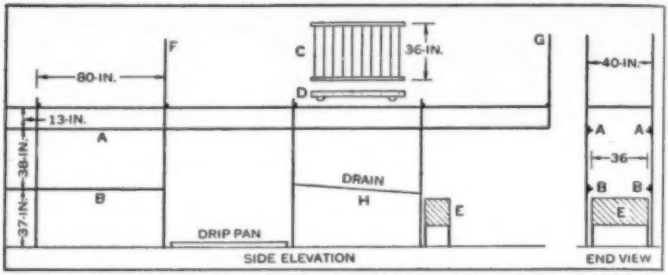
Highly resistant to those liquids prohibited by the 18th Amendment and producing a varnish-like surface with two coats, "364" Furniture Lacquer provides definite proof of real progress in the development of pyroxylin finishes.

You will find that for table and dresser tops this material exactly fills the bill. You must see this fine finish to appreciate its full possibilities. Write for samples.

BERRY BROTHERS

Varnishes Enamels and Lacquers

Detroit, Michigan *1858—70th Anniversary—1928* *Walkerville, Ont.*



Side and end elevations of 2x4-in. wood framing which supports angle-iron tracks "A" and "B" on which carriers travel. The carriers are made as shown by plan view "C" and side elevation "D".
Every third upright extends to a roof truss as shown at "F" and "G".
The sloping drain-board "H" has sideboards or splash boards not shown in the drawing
The dipping tank "E" is portable.

beyond the drain board, the paint is so thick it would not drain back, and the drain board would be hard to reach to clean off. Then too, the use of drip pans leaves room for a man to walk across, if necessary.

The lower levels of angle-iron tracks are stopped off 18½-ft. shorter than the top track to take care of the room required for working and for drainage as just mentioned. The writer has had five sections, such as those described above, running for 100-ft., each with three track levels. When the top row is filled the carriers are taken off at the end and placed on the lower rows.

Each carrier is made of two pieces of 2x4-in. lumber, 6-ft. long and spaced the width of the distance between the angle iron rails that serve as a track. These 2x4-in. pieces are connected by steel cross rods ⅜-in. in diameter; dipped articles are hung from these rods. The number of rods depends on the size of the pieces dipped. I generally put in ten to 15 rods to a carrier. The carrier is equipped with four roller bearing wheels, so it can be moved along easily. In some installations, where it is not feasible to run the trackage and framework for long distances, I cut down the length to 20-ft. and place portable racks at the ends, so the carriers can be rolled onto these transfer cars and then conveyed to points desired.

The paint tanks are portable and are of such height that they just fit under the low ends of the drain boards. Each tank is provided with an outlet at the bottom.

In these installations it is always a good plan to provide a forced circulation of warm air to help speed up the air drying of the enamels. In my last installation I placed a modern heating-system unit at the side of the racks, along their midlength. This unit has outlets in three directions and it speeds up the drying considerably, especially on damp, foggy days. What we paint one day, we ship on the following day.

The character of lacquer finishes, as exhibited the present season, will show continued improvement, due to the work of research chemists and manufacturing interests.

Beauty is only skin deep—
but it's the deciding factor!

To build an excellent product—using choice woods, good hardware, sturdy construction—and then to attempt saving a few cents on finish—is wrong.

The beauty of the finish, although it is only skin deep, is the deciding factor in the consumer's mind—it makes or breaks a sale.

The slight additional cost of the best lacquer available is economy in the end because of its powerful sales ability.

We have one hobby—Quality. Comparative lacquer tests, on your product, are to our liking. Will you try it?

"No Tampering With Quality"

The

ROCKFORD VARNISH
Company

ROCKFORD, ILL.

What It Takes to Get a Good Finish—II

Last installment of a two-part article in which it is pointed out clearly and logically what elements enter into each step of the entire finishing process and why each one must be "right" to produce a satisfactory "ultimate result"

By T. E. Moorefield

THIS QUESTION of mixing coats of various manufacture and of mixing together, for one coat, materials of different manufacture is even more important in the use of lacquer than in the use of varnish, because of the stronger solvent action of lacquers and their different behavior. The stain and filler, or the paint undercoats for a colored finish must be carefully chosen with the peculiar requirements of a lacquer finish in mind.

Oil stains are not well suited for use under lacquers because of their tendency to "bleed," which results in discoloration of the finish and a slowing-up of the drying action of the lacquer. Likewise, some fillers not especially made for use under lacquer, have a tendency to turn white in the pores or show other defects.

Lacquer Reducers; Thinners

In this connection it is well also to caution users of lacquers against using reducers other than those recommended by the maker of the lacquer. Many low-priced lacquer reducers are now being offered to the trade; some of them work satisfactorily under certain conditions, but give much trouble under other conditions. Particularly is this true with the tendency to blush. Many of these lower-priced reducers have very little blush resisting properties and are likely to give considerable trouble.

Many users of lacquers have trouble with moisture in the atmosphere causing the lacquer to blush considerably; this trouble can be lessened by using a reducer that is properly constructed to hold the nitro-cellulose in solution.

Numerous users of lacquers seem to have the idea that all thinners are the same—that the difference in price is simply due to the fact that some manufacturers can get more for a reducer than others.

The truth of the matter is that the old adage, "you get what you pay for," holds true with lacquer reducers as with all other materials.

To avoid trouble it is much better to use the reducer and other materials approved by the maker of the lacquer, rather than to substitute something else merely because it may be cheaper. Then, in case of trouble, there is no question as to where the responsibility lies; you have only one source of supply to look to for a remedy.

Follow Suitable Methods

So much for the question of materials. The second factor, "methods"* also has an important

* Refer to last month's issue for beginning of this article.

NIKOLAS LACQUERS

SINCE 1890 we have made only superior quality lacquers, because inferior quality is always disappointing, no matter how cheap it may be.

No great success was ever made with an inferior product. That is one reason we don't make it.

G. J. Nikolas & Co., Inc.

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bearing on the finished results. Each coat of material should be applied according to the recommendation of the manufacturer, and the schedule should be such as to insure each coat being dry before the next one is applied.

This question of methods also includes the means of application. For example, a perfectly good filler, that would give excellent results if applied by brushing, may not properly fill the pores if applied by dipping. Again, if the filler is wiped off too soon after it is applied, or if it is not allowed to dry sufficiently it may not give good results, although there may be no fault in the filler itself, the fault being merely in the method of handling it.

The same holds true with each of the other coats. If they are of the proper quality and are properly handled they will usually give good results, but if they are improperly handled the results are almost certain to be unsatisfactory, no matter how high the quality of the materials.

Finishing Equipment

The third factor in producing a good finish is a highly important one. Properly designed equipment, well suited to the work in hand, is essential to good results. This applies not only to brushes, spray guns, exhaust booths, air lines, rubbing machines and such equipment actually used in applying and rubbing the materials, but also to the racks in which the work is placed, the ventilating and heating systems and so on.

Conditions Influence Work

Materials, methods and equipment may all be of the very best, yet if the fourth factor, "conditions," is not right the results will be questionable. The room and all the equipment must be clean. Oil and water must be removed from the compressed air. A plentiful supply of oxygen must be available. Heat must be applied when needed.

The relative humidity must be regulated and the work must not be stacked together too closely. If these details are not attended to, there is danger of blushing, case-hardening, poor drying, shrinkage, cracking, checking, sweating, dirty work and a host of other troubles showing up before the work leaves the factory or after it is in the hands of the consuming public.

Final Factor—Manpower

As was mentioned earlier in this article, the fifth factor, "manpower," is really the most important of the five. If the manpower of a finishing room is right, all the other factors will be well taken care of. If slovenly, untrained workers are employed, however, the results are likely to be poor, no matter how much money may be spent on materials and equipment.

In producing finishes which have a direct sales appeal, manpower also plays an important part in deciding what kind of finish is best suited for the particular article to be finished and just what methods and equipment will be most satisfactory in producing that finish.

When these five factors are properly combined and carefully directed they will result in a finish that is attractive and durable. Once a reputation has been made for producing attractive finishes that stand the test of time, a manufacturer will find it very easy to hold the business he already has and to attract new desirable customers.

FLINT LACQUER PRIMER

Time-Tried and Tested

Flint Lacquer Primer was the original first coater for a clear Lacquer hard finish offered to the furniture industry . . . it has been tested and tried over a long period of time throughout the industrial field . . . why experiment when you are assured ot

PROVEN MERIT

The constantly increasing demand for FLINT LACQUER PRIMER proves conclusively that this is the ideal foundation for clear Lacquer finish.

It sands more easily . . . dries more quickly . . . is more durable . . . and knits perfectly with succeeding Lacquer coats.

MAYER & LOEWENSTEIN
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Leaders since 1846

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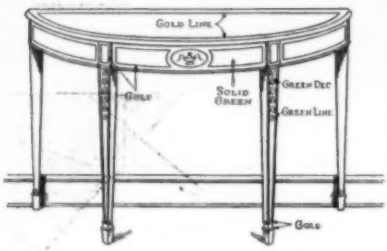

Foreman finisher submits an example of modern decorative finishing—a mahogany console table of the Adam Period, artistically gilded and decorated—and submits detailed information on how the work is done

Decorative Art on Mahogany Console Table

By Lawrence F. Hess, Jr.

THE WRITER believes this article will be of interest, and also a guide to those following the trade in its ever changing cycles. There has been a considerable drop in the demand for decorated furniture, due to the fact that too many inferior imitations have been put on the market; the true lover of things beautiful has declined to buy.

It is up to the foremen finishers to revive public interest in quality furniture properly decorated, using every possible means in their power. With the proper help from his organization, the furniture finisher can put over something big—something that will be beautiful and at the same time can be produced commercially.

For example, I have in mind an Adam half-round console table made of mahogany, and I will explain the method of producing the finish according to a standpoint of economy and production.

The following is the formula for the mahogany finish:

The first stain is made up of four pints of warm water to ¾-oz. bichromate of potash (crystals). Apply with brush and wipe quite dry.

For the second stain, add to one half gallon of warm water:

1-oz. seal brown No. 99* (powders)
1-oz. mahogany No. 98* (powders)
½-oz. yellow No. 94* (powders)
¼-oz. orange No. 96* (powders)
¼-oz. black No. 540* (powders)

The second stain should be applied with a shading air brush—not too dark, so that the "flame in the wood will remain luminous." When the stained wood surfaces are dry, apply a thin coat of shellac; then sandpaper and fill in the usual way with brown mahogany filler. Let the job stand over night and spray with a wash coat of lacquer.

Decorating and Striping

The legs and top of console should be striped with narrow line of light green, placed 3/16-in. from the edges of legs and ¾-in. from the edges of the top. The half-round apron at the front should be blocked in with solid green of the same color, allowing a margin of ½-in. all around same and edging off with a hair-line stripe of gold (illustration will

*More specific information furnished on application.

W-Seal Brevolite - - -

1. - A positive seal that prevents bleeding of filler and stain.

2. - Lays the grain—requires only a light sand.

3. - Drys quickly; may be sanded and re-coated in one-half hour.

W-Seal is the most durable under-coater you can use under a Lacquer finish on wood.

A five-gallon trial order will be shipped you at $1.75 per gallon. You alone are the judge as to its suitability.

WAUKEGAN CHEMICAL COMPANY

"Values that Endure"

Waukegan Illinois

BREVOLITE Lacquers and Lacquer Enamels and BREVOKRAK Krakles are hard wearing, good covering materials.

give details) using Adam decoration in center of leg and also in green portions of front.

The mouldings are in burnished gold—either leaf or powder—but if expense is an item use very fine gold lining bronze. Protect all these decorations with a wash coat of lacquer and tone down the whole table with a Van Dyke brown glaze. This will not discolor the mahogany, but will soften the decorations and gold.

Be careful in picking out highlights in decorating; use some artistic judgment and skill, as otherwise you might ruin the whole effect. Let the work dry over night and proceed to finish by spraying one coat of lacquer over all the surface, and rub when dry. This process, to my knowledge, can be adapted to quantity production and at greatly reduced costs, at the same time obtaining an excellent product.

Being Sold on Lacquer

It is a good thing to be sold on an idea, a product or a proposition. However, one ought to be able to advance pretty sound reasons for being sold on a thing.

Seven or eight years ago, this writer was sold on pyroxylin lacquer finishes—not so much as the real present finish but as the coming finish, if properly developed. To a great extent I have seen my ambitions and hopes realized. Probably the greatest asset a pyroxylin lacquer has is its quick drying features. In fact I am well acquainted with a number of concerns that have not had such pleasant experiences with pyroxylin lacquers, due to their own lack of understanding as to the application of this material and due to using poor goods.

I know men who have been and still are sold on lacquer finishes because they knew that a pyroxylin lacquer, properly made and properly applied under the right conditions, would give a finish unequalled.

On the other hand, I know men who were blown by every wind that came along. This originates sometimes with their employers. I know of men who absolutely knew nothing about lacquer at all but, because they sold competitive finishes they saw fit to do everything in their power to put lacquer finishes out of existence. Some of them resorted to telling stories.

Here is the moral. If you are not sold on lacquer as an ideal finish for many purposes, in preference to the old type finish, think of the fact that your own judgment stands about 10 to 1 against you. In other words, in spite of what concerns, salesmen or others could say about the present day pyroxylin lacquers, the fact remains that manufacturers the country over, after careful comparison, have almost unanimously adopted the pyroxylin type of finish.

I do not say that varnishes, oil enamels, etc., are not or will not be used. I repeat that the pyroxylin lacquer, by its demonstration, has vindicated itself as an ideal finish that replaces hundreds of uses for the older type finishes. Five years is long enough to prove it.—J. C. Hertstein, Jr.

When mixing dry pigment material with a liquid, the liquid should be put into the pot first and the dry material added to it a little at a time, stirring all the while. Failure to use that method is bound to result in a lumpy batch of material.

The Modern Sealer

Pearl-Lac

A Grand Rapids Varnish Corporation Product

Not a Substitute for Shellac

Pearl-Lac actually fills a long felt want and need for a spirit sealer.

It hardens the fibre of the wood or substance to which it is applied and possesses remarkable sanding qualities. In fact, it will sand down to a hard, flint-like, glossy surface.

Although opaque, it does not cloud nor detract from the color of the finished work.

Pearl-Lac No. 1 is recommended for use under varnishes, oil enamels and other finishes of that type. It will reduce farther than any other spirit coater being offered today. Pearl-Lac No. 2 proves an ideal sealer under lacquer and lacquer enamels.

This piece of goods merits the attention of all foreman finishers engaged in the production of furniture and other well finished woods or fibre products.

GRAND RAPIDS VARNISH CORPORATION

General Offices, Factories and Studio Service in The Furniture Capitol of America

Why automobile tires are being painted black, in what proportions the paint and thinners are used, and how the application of tire paints is handled according to dipping, sponging, spraying and brushing methods

Using Black Tire Paints Economically

By L. F. Worlendar

THE DEMAND FOR COLOR and fine finishes on automobiles has led motor car manufacturers to give closer attention than ever to all details that contribute toward attractive appearance of the car on the display floor. Body lines, color combinations, nickel-plated parts, bumpers and other accessories are utilized to present the automobile in the most favorable light. Until recently, tires were accepted just as they came from the moulding room, but now some manufacturers are covering their tires with a black tire paint.

The advantages in the use of such a tire paint are several. All new tires are covered with a fine white dust that makes them disagreeable to handle. The use of black tire paint eliminates this dust and at the same time greatly enhances the appearance of the tire on the car, or in the racks of the tire dealer.

Being a solid-covering, glossy-black product, the tire paint also improves the appearance of the spare tire on a car and eliminates the need of a tire cover for protection from the weather and the sun. The dried film also excludes moisture and air from the tire while in stock and undoubtedly retards deterioration of the rubber.

Methods of Application

Several methods of using the paint are in vogue. It can be brushed full-body and will give a smooth, solid, uniform covering in one coat. For spraying, some manufacturers use it full-body while others reduce it in varying proportions—all the way from ten parts of paint and one part of naptha, to equal parts of paint and naptha. In general, I feel that the less reduction given this material for spraying the more economical will be its use, inasmuch as the extra thinner added to it merely evaporates and is lost.

Dipping Method

Where the dipping method is used, the tires are placed on a

Hopkins Spray Guns

High Pressure Atomization— Low Pressure Distribution

No. 1 of a series showing why Hopkins Guns are Preferred

¶ Do not clog
¶ Reduce Finishing Costs
¶ Make any Operator more Expert
¶ Eliminate Orange Peel
¶ High Pressure Atomization — Low Pressure Distribution

Model TPG

Spray painting engineers have been attempting to develop a low-pressure spray gun for several years.

Knowing that high-pressure is necessary for atomization of the finishing materials, our engineers have developed a new principle and produced a gun in which the Pressure is "stepped down" after it has atomized the material.

In this way we have attained low-pressure distribution without sacrificing the benefit of high-pressure atomization.

Write today for more complete description of this new principle.

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spinning wheel and dipped into a mixture of two parts of naptha and one part of paint. The tire is raised out of the paint and allowed to spin one minute to throw off excess material and to partially dry it. A second coat is then dipped and the tire is allowed to spin one minute. This is followed by a third coat after which a period of five minutes for spinning is permitted. The tire is then hung on a rack and allowed to dry approximately two hours, after which it is placed in stock.

Some of the smaller users reduce the black tire paint about equal parts with naptha and apply it with a sponge, but this method is not so satisfactory because the sponge usually leaves streaks in the finish. Others prefer to use benzol in place of naptha for reducing the paint, so as to take advantage of the quicker drying time. The use of benzol proves quite satisfactory where the paint is applied by brushing or spraying, but sets too rapidly to work well by the dipping method.

Spraying; Brushing

When applied by spraying or brushing, one coat is sufficient to give a good covering and a nice finish. The dipping process requires the material to be thinned to a greater extent to get good flowing qualities and, where this method is used, two or three coats should be applied—with only a short drying time between coats. By whatever method the black tire paint is applied, it will be dry to handle within several minutes and can be placed in stock within two hours.

There are indications that there will be a wonderful field for the use of this material, not only among tire manufacturers but also with tire service stations, operators of large fleets of cars such as taxicab companies, dealers in used cars (for brightening up the old tires) and large refinishing shops which like to turn out a repainted job that is complete in every detail. This is a new product and a new use for paint.

Varnish for Violins

A Parisian violin maker claims that the tonal quality of a violin is not so much dependent on the construction of the instrument as it is on the quality of the varnish used in its finish. He claims to have made a varnish which will make an ordinary violin sound like a Stradivarius.—J. Cowan.

If you thoroughly stir the contents of a can of paint to dissolve all the oil, then fill it up with water, you can leave it open and the paint will keep perfectly fresh.—J. C.

Clean work requires clean spray guns, material, hose and containers.

Pratt & Lambert Distributor at Kansas City

Official announcement has just been made of the election of Granville M. Breinig as president of the Waggener Paint & Glass Co., of Kansas City, Mo. Other officers of the company are: C. D. Sproule, Chicago, vice-president, and A. W. Cook, Kansas City secretary-treasurer.

The Waggener Paint & Glass Co. is one of the old and well known paint manufacturing concerns in the Southwest, enjoying for many years a well-earned reputation for the manufacture of high quality paints and the distribution of Pratt & Lambert varnish products.

Transparent!

RED S. FLAT VARNISH
preserves the full beauty of
the wood because it does not
cloud the finish.

Three finished effects:
Oil Rubbed
Dull Rubbed
Dead Flat

THE SCHAEFER COMPANY
1315 West Kentucky Street
LOUISVILLE, KENTUCKY

Manufacturers of
Varnishes and Lacquers

"As a preface to this article I will say that, as an aid to the finishing trade, 'Industrial Finishing' can not be commended too highly; in every issue we find much to interest and aid us in solving our daily finishing problems which, without its help, would often times be much more difficult to solve. At this time perhaps an article on oil polishing would not go amiss."

Oil Polishing; French Polishing

Foreman Finisher explains some points about these finishes which, although never employed on a production basis, have certain characteristics that recommend them at times for special finishing jobs

By John A. Twamley

NOW, in the first place, oil-polishing is perhaps conceded to be the oldest of all attempts at wood finishing. Oil has a beautiful darkening effect on the dark hardwoods. The softer parts of the wood absorb the oil to a greater extent than the harder or closer-grained parts, so naturally, the oil fulfills the duty of a stain, that is, it brings out more prominently the natural beauty of the wood.

Oil plays an important part in finishing, even where other means are resorted to for final polishes —as in French polishing or waxing, for example. However, we seldom use oil on light colored woods owing to the fact that its effect is usually unpleasant. Now, strictly speaking, oil-polishing means simply this: The application of linseed oil to the surface of the wood, and subsequent rubbing until the desired dull satin gloss is obtained.

There is considerable confusion in regard to different methods advocated to accomplish satisfactory results, without consuming too much time. No furniture manufacturer could afford to spend the time necessary to produce this oil-polish finish on a large scale. Perhaps at some future time there may be enough demand for it to make the operation a paying one, but up to the present only special jobs are finished in this way.

It takes years to perfect the process of oil-polishing. In fact we might say that it is never really finished, for the occasional rubbing, which usually is given perhaps but once a month, serves only to add to and enhance the beauty of its color and softness. Oil seals every surface pore of the wood by filling it and, of all polishes, this one is least affected by climate. Hot dishes and warm water do not affect or injure it, yet the coating of oil on the wood is so thin that it is almost an impossibility to measure it. So far, so good.

The Wood Surface

Perhaps now it would be well to say something relative to the preparation of wood surfaces for oil-polishing. Naturally, to gain satisfactory results when applying the oil-polish, the surface must be absolutely smooth. I cannot urge too strongly the

necessity for this. One must go over his work very critically in order that he may discover even the most minute scratches or abrasions, for if they are left the polish will only serve to magnify them.

If possible, fill all holes with a dark wax stopping, and remember that mahogany and oak turn a rich brown under the influence of oil, while walnut turns almost black. One may stain the wood with almost any kind of stain but, in the case of walnut, this is not necessary as this wood is dark enough without staining.

French Polishing

Now just a word on French polishing—and let me state that it is unusual now-a-days to see a piece of genuine French-polished work on the market. French polishing is by far the most difficult of all wood-finishing; for this reason only small pieces of flat work should be attempted at first.

French polishing is the application of shellac by rubbing it over the wood with a cloth—a rubber especially constructed for this purpose. It is done in three distinct operations:

1—Filling the pores of the wood and putting on a body of polish.

2—Smoothing out the polish to eliminate any early marks which the heavy polish has made.

3—Spiriting out with pure alcohol. Perhaps I will treat of these processes in a future article, but at this time let us deal with one or two of the preparatory processes.

Shellac Used

We may be allowed to treat only one of these processes here, namely, the polish. French polishing for the most part, is done with white-shellac or orange. Only occasionally is the polish colored. Shellac may be made easily and it oftentimes will give better results than the prepared compound, although white or bleached shellac is very difficult to make, for it requires the bleaching out of all the orange coloring by a chemical solution, such as potash, etc.

It would be much better for the amateur to buy his white shellac for the finishing of natural woods. To prepare a good quality of orange shellac, add a pint of denatured alcohol, or better still (if it is to be had) pure grain alcohol, to six ounces of shellac gum. By all means refrain from using wood alcohol for French polishing, as it will not work satisfactorily.

Precautions To Observe

The gum will dissolve more readily if it is broken into small pieces. Allow it to stand in a bottle over night; next morning it will be dissolved ready for use. If you find the shellac contains dust or dirt of any kind, be sure to strain it through a clean piece of muslin. Never allow even the smallest amount of water to enter the shellac. Never put shellac in a metal dish or allow anything made of metal (the handle of a brush, for instance) to lie in it. Metal will impair the color of orange shellac and discolor white shellac badly.

In the above, I have not treated the subject as thoroughly as I would like to, but in a future article I will go into it more fully.

No argument in the world can ever compare with the one dramatic demonstration.

Industrial Finishing

Issued tenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

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Publishers

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EDITORIAL

Surfaces That Don't Show

Much effort enters into the preparation, finishing and polishing of wood and metal surfaces that show, but often the time, labor and materials expended on surfaces that are exhibited to view is soon defeated, due to neglect of the backs or edges of those handsomely finished face sides.

If the finished sides are of wood, then the backs and edges deserve careful and thorough protective coatings to prevent damage from exposure to changing atmospheric conditions, excessive moisture, heat, vapors, fumes, etc. Otherwise, warping, checking and general finish-deterioration may occur.

In the case of metal, there are rust and corrosion to guard against; also the flaking off of finish where the finished surface adjoins an unprotected surface. In other words, when you "save the surface and you save all," be sure to treat and save all of the surface—not just what shows on the face side.

A Finishing Room Fire

A newspaper item which we noticed recently, reported a finishing room fire as follows:

Fire, believed to have been caused by spontaneous combustion, caused a loss today estimated at between $15,000 and $20,000 to the- - - - furniture factory here. The blaze started in the finishing room. Water put out the fire but ruined a large quantity of furniture.

Since this plant is modernly equipped and since the organization has a wide reputation for progressiveness, efficiency and general alertness, we were very much surprised to learn of such a serious fire in the establishment. Investigation revealed that it was not one of the overly-advertised "lacquer fires" or "spray booth fires."

It was an old-fashioned "rags in a wooden barrel" fire which started late in the evening after workmen had left the plant. In one of the top-floor finishing rooms near a varnish spray booth —near outside walls—there was a wooden barrel in which workmen threw soiled wiping rags. What a fire-starting device to tolerate, especially in a finishing room, and on one of the top floors of a furniture factory!

Perhaps workmen were *not supposed* to throw soiled wiping rags in that wooden barrel, or if they did, someone probably *was supposed* to remove the rags at the close of each working day. It has been hinted that a few dangerously "wet rags" were in the bottom of the barrel and that later these rags were covered—and of course, hidden—by rags that were

practically clean, dry and safe. At quitting time, therefore, a glance at the barrel probably revealed it to be about half filled with rags which apparently were clean enough and dry enough to be considered safe. At any rate, the barrel wasn't emptied.

Within a few hours spontaneous combustion occured and soon the room was all ablaze. A switchman, working late, saw it and turned in the alarm. However, the fire department wasn't needed; automatic sprinklers, released by the intense heat, put out the fire. Water flooded the finishing department and flowed down onto the lower floors; as a result, water damage to the amounts named in the newspaper item, occurred. Damage directly by fire alone amounted to perhaps as little as $25.00.

This costly incident furnishes something to think about, for example: Safety precautions, metal containers for waste rags, careful and regular inspection, strictly enforced orders, watchmen, automatic sprinklers, provision for outside drainage of water released on upper floors—and the possible advantages of single-story factories.

Problems For Experts

The finishing of industrial products is becoming more and more an activity that is largely dependent for its commercial success today upon the intelligent advice and co-operation of two classes of technical experts.

Logically, the first to consult is the artist or designer—a man well informed in regard to the use of colors, shades, tones or hues for appropriate use on the product in question. Upon his recommendation will depend the intelligent selection of color values and the proper use of any decorative features that may be necessary or desirable to give the article an original or classic appearance, or some other characteristic element of attractiveness calculated to furnish an outstanding sales appeal.

Next in line, either directly or indirectly is the chemist in the finish manufacturer's organization—the man who through specific study and research is competent to formulate a finish designed especially to suit the surface to be covered and which will consist of the proper materials for all coats, giving the result in color, shade, tone or hue specified by the artist or designer.

Finishing materials can be supplied to meet whatever reasonable conditions may be imposed or required by the user. The finish can be formulated to give durability, lasting luster, permanency of color and resistancy to certain elements that would damage a less effective finish; it can be designed so well that it will give no trouble in application, in storage, in transit or in service. Or a cheaper finish can be supplied to meet, as the first requirement low price in first cost and cheapness, in application.

Humidity and moisture, not controlled, are sources of trouble to finishers.

Water White Lacquers No. 82

For Gold
For Silver
For Brass

Always Dependable

Established 1857

CHAS. COOPER & CO.

90 Worth St., New York Works Newark, N. J.

"A beautiful finish deserves a well-built foundation."

The Foundation of a Fine Finish on Automobiles

Emphasizing the importance of beginning right for satisfactory results; cleaning the metal surface, applying and sanding primer and surfacer coats and finally, spraying on, drying and rubbing the lacquer finish coats

By Joseph F. Schmoegner

CONSIDERING that, on the subject of finishing automobiles, much has been written, I would like to point out some operations that often are neglected.

I think the majority of automobile finishers will agree with me that their supreme aim is beauty of finished products. It is very essential that a motor car must look at its best after it leaves the finishing room, but we must not overlook the fact that our finished product must have wearing qualities for a reasonable length of time.

If we want to give justice to the finishing materials we are using, it is highly important to apply the priming coat on a surface that is not only mechanically clean but, I venture to say if we expect absolute adhesion, it must be chemically clean also.

At the Photo-engraver's

To illustrate my point, I will relate an experience that I witnessed at a photo-engraver's establishment. The superintendent pointed out several copper plates that had been spoiled by exposing them with the photo-engraver's enamel baked on. He wanted to know if I could remove the enamel without injury to the highly polished plate. I tried various methods but failed to remove the enamel without injuring the polished surface.

Naturally I became interested in the application of this enamel —more so because I never found suitable material that would stick definitely to brass or copper. This enamel of course can not be used in our business. Its mixture is Russian glue with a small amount of bichromate of potash. But correct adhesion is accomplished through a painstaking cleaning process. The metal surface is made not only mechanically clean, but chemically clean also. I have tried out the same painstaking cleaning processes with wonderful results.

"Work Clean"

If we practice the same care in the application of our first coat of primer, we have a good foundation upon which to create a beautiful finish. It is really worth while to be very particular and "fussy" in the way we apply the priming coat, since on its adhesion depends our entire finish. It must form an absolutely solid and moisture proof film.

How can we accomplish this task? Again I will say, "work clean." Strain your primer with the same care as you would strain varnish. If you apply a clean coat of primer free from dust and grit,

1/2 time labor cost

A new lacquer that cuts sanding costs in half - - - and gives a more beautiful finish

CLEAR Tone Velvet Lacquer will recommend itself to you for ease of working as well as for economy.

It dries quickly.
It is the easiest sanding lacquer we know of and positively will not clog sandpaper—an important consideration.
The last coat dries to a true rubbed effect and requires no sanding.
It does not settle.
It does not cloud the work.
It prevents "pinholing."
It does not polish up with wear.
It will intermix with any good lacquer.

In these days of increasing use of Lacquer, this method of obtaining a quality finish economically is of great interest to finishing departments.

If you have any special problems, we shall be glad to help you in solving them. Your problems are *our business.*

Ask for data on Clear Tone Velvet Lacquer, or for demonstration.

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Newark Chicago
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Essex Varnish Company, Newark
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Murphy *Clear Tone Velvet* Lacquer

MURPHY FINE FINISHES
Famous for 63 years among architects, master painters and makers of products requiring a fine finish.

Air-drying and Baking Varnishes
Enamels, Lacquers and Stains for Brushing and Spraying and Dipping

you will not have to trouble yourself to use a grade of sandpaper that will destroy your most valuable priming coat.

Primer; Surfacer; Lacquer

On production work I prefer to use an oil primer by all means—preferably a primer that will bake at a temperature between 275 and 300-deg. F. in an hour and a half. On custom work, if wearing qualities are expected, I will again recommend an oil primer that should be dry under all conditions in 48 hours.

The baking process of the priming coat is very important. It should be baked sufficiently hard that ordinary wiping with a cloth saturated in lacquer thinner will not destroy the film. But if wiping should be continued at a more strenuous rate, it should slightly soften under this action. Once we have found this point, we will have proper adhesion between primer and pyroxylin enamel, if no surfacer is used in between.

If we contemplate surfacing, I again give preference to a short-oil surfacer, especially if the surface of the metal is not perfectly smooth. Generally a pyroxylin filler and knifing compound will soften under the action of lacquer and therefore sink and follow the irregularities of the metal surface. But upon the oil surfacer—if thoroughly dry—such action will not occur; lacquer finish will not change the level surface to which it has been brought.

As we all know that lacquer hasn't the filling qualities of varnish, it is highly important that the surfacing shall be absolutely faultless. It should be done with the same care that a varnish job is done in the final operation of varnish rubbing. Any scratches, pin-holes, etc., should be carefully done away with, if we expect an absolutely high-grade job. It also will save a considerable amount of pyroxylin lacquer and the spraying coat will flow out much better, due to the fact that we can reduce it further with thinner.

Three coats of lacquer should produce a satisfactory job if the above rules are followed. As to the spraying, there are no set rules; it varies with different equipment. Applying a full even coat is about all that is necessary. The last coat should harden at least 24 hours before it is rubbed and polished.

Ninety firms are now manufacturing airplanes; six a day are being produced in the U. S.

Interior Gloss; du Pont

The Paint and Varnish Division of E. I. du Pont de Nemours & Co. announces a new product known as "Du Pont Interior Gloss." This has been placed on the market as a result of the general demand for a medium-priced semigloss finish for interior walls and woodwork. It is claimed that it has excellent covering and hiding properties and produces a durable film that may be washed. It is available in six delicate tints that are in keeping with the present day demand for color in the home.

Consulting Chemists

Mr. Karl B. Thews, formerly Vice-President of the Pittsburgh Lacquer & Chemical Co., Pittsburgh, P., has associated himself with Thews-Harbison-Thews, Inc., Consulting Chemists and Metallurgists, Mulford Bldg., Philadelphia, Pa.

Mr. Thews will be in charge of the chemical division. He is also retaining his office as Secretary and Treasurer of the American Chemical Co., Empire Bldg., Pittsburgh, Pa.

Mr. R. J. Snelling, formerly General Manager of the Pittsburgh Lacquer & Chemical Co., Pittsburgh, Pa., will be in direct charge of the lacquer consulting and research work.

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They combine

- Novelty
- Durability
- Brilliant Colors

Can be applied to

Wood
Metal
Cloth

or, almost any clean surface

No Sanding No Rubbing
Maximum Coverage

Walker Service
goes with Walker Lacquers

Let us hear from you

HENRY V. WALKER CO.

Office and Salesroom
17 John St. New York

Rust-Proofing Iron and Steel

The material and dip process described in this article is widely used in industry as a treatment for iron and steel surfaces which, later, may be left bare or finished in paint, enamel, varnish or lacquer

By J. W. Sweet

A RECENT newspaper editorial carried this statement:

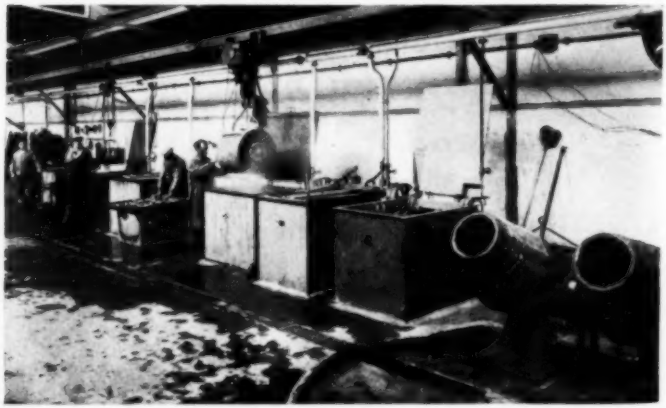
"Rust rot is worse than the combined damage from floods, droughts, lightning, frosts, railway accidents, and shipwrecks. It exceeds the havoc wrought by insects; and every bit of it is preventable."

This argument was used in connection with a plea for more paint. Paint, in any of its many forms, is a fairly good means of rust prevention, but paint requires replacement.

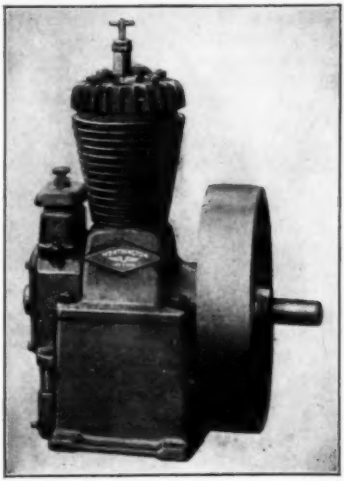
The real problem of rust prevention on iron and steel surfaces lies deeper than any superimposed finish like paint, or even ordinary plating. Permanent rust prevention requires treatment of the metal itself—some conversion of the surface to an insoluble film seals the metal away from the effects of air and moisture.

Every manufacturer, in whatever line of industry, has to contend directly or indirectly with the problem of rust; if not directly with his product, then indirectly with the machinery and tools he employs.

Iron ore, from which metallic iron is produced, is essentially oxides of iron, or rust. Every year millions of tons of iron are produced in the blast furnaces of the world. Eventually, this iron is used in the fabrication of numberless articles, ranging from needles and pins to bridges, skyscrapers, automobiles and machinery. On every hand we see evidence of the rusting of these articles, or in other words, the iron reverting to its original state.



Three 250-gallon units in operation; capacity for rust-proofing about 2500-lbs. of small parts per day.



Long life...

and satisfactory service

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Reg. U. S. Pat. Off.

Force-feed lubrication, positive and foolproof, reduces the wear of moving parts.

Compressor cooling system is amply proportioned and compressors are furnished in either air-cooled or water-cooled types.

The balanced crank and balanced flywheel prevent vibration and contribute to the long life of this machine.

The shaft, crank, pin and counterweight are all a one-piece drop forging, while the frame is of sturdy, simple and accessible design.

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Wasted Iron and Steel

It has been generally estimated that 25 percent of the amount of iron produced yearly is destroyed by rust. Since it requires from three to four pounds of coal to produce one pound of steel, it will be seen that the toll of rusting is a costly one.

And while the money loss is tremendous, the waste of human effort is more costly. When we look upon a finely-finished steel tool of intricate design, it requires some imagination to visualize the many man-killing processes that brought it into being.

It required the hardest sort of labor to wrest the original ore from the deep strata of rock in which it was embedded; its transportation from mine to mill was accomplished at no small cost of money and brawn; the separation of metal and dross in the furnace is one of the hottest, heart-breaking jobs in the metal industry; the refining and development of the steel required the sweat and labor of many workers; and the final manual and mechanical shaping of the finished article drew upon the time, skill, and ingenuity of muscle and brain of our most valuable human material.

All for what? A period of too short usefulness? Or, can it be protected and conserved by a little intelligent treatment? Iron or steel, if left to its own devices and without protection, immediately begins to revert to its original state—rust.

New Protective Material

Until comparatively recent years there were only two well recognized means of metal protection—paint and plating. Now, a newer method is coming into widespread use, and on account of its lasting qualities, its low cost and easy application, it is being adopted by many of the largest manufacturers in the country.

It is so different from ordinary coatings, and so desirable in some of its characteristics, that it is being utilized where no other type of finish would be practical. This finish is what is known as "Parkerizing," so called after the company* that developed it. It represents a chemical treatment of iron or steel. It is applied by immersing the articles to be processed in a solution of hot water and a patented dry chemical called "Parco Powder," which converts the surface of the article into a phosphate that is insoluble in water and permanent in the air.

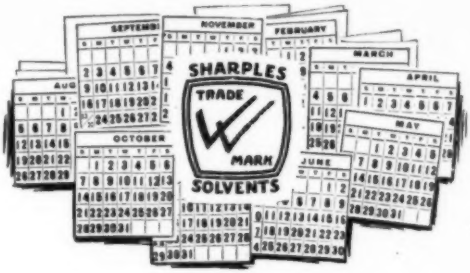
This treatment is especially desirable on outside ornamental iron work, and in many cases permits the use of iron where the more expensive brass or bronze might seem to be necessary. Parkerized iron can be used in connection with marble, terra-cotta, or brick without the danger of rust stains developing after a short period of exposure.

Process Widely Used

Automobile companies are among the largest users of this finish for the treatment of bolts, screws, washers, etc., on exposed parts of the car; being black, they can be used in the final assembly without touching up with enamel after they are installed. In many cases it is replacing galvanizing on some of the most important parts of the car.

Practically all of the larger typewriter companies make use of this process. It is also used extensively on telephone and switchboard parts, talking machines, and airplanes, cameras and canning machinery, pins and pumps, rifles

*Parker Rust-Proof Co., Detroit, Mich.



PENTASOL AND PENT-ACETATE

were introduced to the lacquer industry about fifteen months ago. Today their quality is favorably known to practically every lacquer manufacturer in America. Nearly all are using one or both in their standard formulae

This remarkable record is, we believe, attributable, not so much to the unusual purity of these products, as to the fact that PENTASOL is Amyl Alcohol and PENT-ACETATE, Amyl Acetate. These Amyl products are recognized by the most experienced lacquer experts as the most important solvents ever developed for the manufacture of quality lacquers.

In the growing lacquer industry lacquer formulae are subject to many offers of change. It is a great satisfaction to experienced formulators to be able to depend on the absolutely uniform quality of PENTASOL and PENT-ACETATE, and to have such products as standards of comparison by which to judge other solvents.

The SHARPLES SOLVENTS *Corp.*
2304 WESTMORELAND ST., PHILADELPHIA
548B RAILWAY EXCHANGE BLDG., CHICAGO
501A FIFTH AVE., NEW YORK

and roller skates and a host of other articles ranging alphabetically to X-ray apparatus.

The process is very simple, as indicated by the layout in the illustration, and can be handled by any workman of ordinary intelligence. It is applied by first cleaning the surfaces to be treated, either chemically or by sandblast; immersion in the processing bath, and finally finishing with stain, oil, paints or lacquers.

Cleaning The Metal Before Refinishing

Sometimes the metal parts of an automobile body are reasonably free from rust and oil, in which event it is only necessary to wash the surface with some suitable solvent liquid, after which it should be wiped dry. Then it is best to apply the primer at once, for rust will soon begin to form on the bare metal unless it is treated.

When handling the clean bare metal, one should wear gloves to keep the metal surfaces free of sweat from bare hands. For a primer, I prefer an oxide pigment, say iron or lead oxide; to thin it out, turpentine should be used.

Cleaning off the raw metal is very important work, and also somewhat tedious and time consuming, but it is very essential to good finishing. Many of the cleaners used—and there are several commercial cleaners on the market—are chiefly composed of an acid, such as sulphuric of the commercial grade, or unrefined. The cleansing fluid is to be applied freely and rubbed in. Wear rubber gloves. The fluid is to be washed off before it becomes dry on the metal. First wash off with cold water, then with hot.

After all this preliminary work, much remains to be done in order to free the surface and all crevices from moisture. A spraying with warm dry air is good; some use a gasoline torch for the purpose. Better than all to my mind, is to place the cleansed body in a heated room with a high temperature; it will be quite dry in about an hour or so.

A new sort of cleanser has a pigment base, and is applied by a spray gun, the same as paint. The pigment is slightly colored so that it can be seen wherever applied.—A. A.

Both output and quality depend more upon the foremen than upon any other class of industrialists.

According to the figures in the last U. S. Census of Manufacturers, the mechanical power used in American industry increased 30 percent from 1919 to 1925 per worker employed, and the value of production per wage earner rose from $2,751 to $3,193 within the same period.

RAUX
ESTER GUM
ESSINS
M.P.
Rosin Ester Gum 115°C
Congo " " 135°C
Manila " " 140°C
Gums cut, fused or treated to meet individual requirements.
ROBERT RAUH, Inc.
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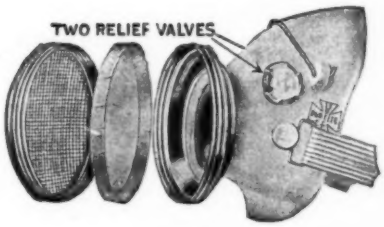
Automobile
LACQUERS
Free from gum
Give dependable finish
Established 1857
CHAS. COOPER & CO.
90 Worth St., New York --- Works Newark, N. J.

Dr. Willson's Dust and Spray Mask

Cleans Dust and Fine Particles Out of the Air You Breathe. Protects Your Nose, Mouth, Throat and Lungs.



Note the practical construction. The filter is special cotton fiber, not cloth or blotting substance. Bad air escapes *at once* through two relief valves. Wire spring over nose prevents face cup from spreading, and insures a comfortable fitting. Price $2.25 each including 12 filters. Extra filters $1.15 per 100.

At your supply dealer, or sent postage paid by

WILLSON GOGGLES, Inc.
READING, PA.

If you need protection from dangerous and penetrating fumes, ask for particulars on the "Willson Fume and Smoke Mask," and state the nature of your work.

Decorative Finishing on Sheet Metal

Describing production operations in the usual process of applying a decorative finish to the surfaces of large metal sheets which are later stamped and pressed into shape to produce the familiar tin containers in which so many kinds of merchandise are packed for retail sales

By C. C. Thorne

THE sheet-metal and tin-decorating industry uses large quantities of finishing materials each year for finishing and decorating tin cans for tobacco, toilet goods, fruits, vegetables, fish, etc. Similar materials are used on toys, advertising novelties, signs, bottle caps and other articles constructed of light gauge metal. Some of the hardest and most durable finishes are produced on these articles, serving not only to beautify the article, and thus promote its sale, but also acting as a preservative agent.

The Ground Coat

In producing these finishes there are three main steps. Usually, the first operation is to apply a solid, ground, color coat. This is sometimes applied by spraying, but more often it is put on by means of a coating machine, consisting of plastic rolls which dip into a reservoir containing the finishing material. The sheets of metal are fed between these rolls and the ground coat is applied to both sides of the sheet at one operation.

In case it is desired to coat only one side of the sheet, two sheets are placed back to back and fed through together. After the ground coat is applied, it is usually baked for a sufficient time at a temperature hot enough to thoroughly harden the coating, so the sheets will not stick together when stacked.

Lithographing

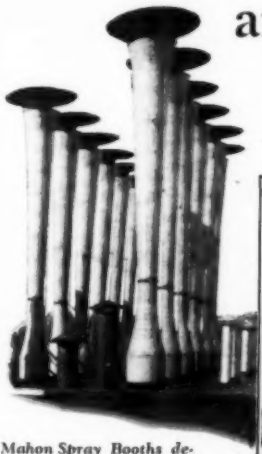
The second step in the finishing process consists of applying the designs, lettering or other decorations over the ground color, using one or more suitable colors for this purpose. Usually these designs are printed either by means of coating machines with proper designs embossed on the rollers, or in a flat-bed press similar to a printing press. Each color in the design is generally baked separately, until the material is hard and dry before the next color is applied.

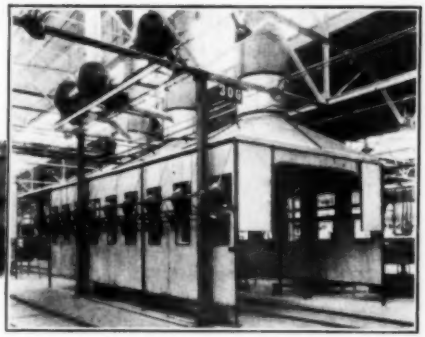
Finishing Coat

After all of the colors in the design have been applied it is customary to feed the sheets through a coating machine which applies a coat of pale, clear, baking varnish. This coat brings out the true color tone of the undercoats and gives a depth of finish, due to the luster it imparts. The finishing varnish is wear-resisting and imparts durability to the finish.

On fruit cans, fish cans and similar containers for foods, it often happens that only one coat of finishing material is applied. This is an amber-colored varnish which, when baked hard, gives a golden, decorative color and finish all in one. On the inside of cer-

Mahon Spray Booths are Built to Fit the Product





Mahon Spray Booths designed for painting double deck bus bodies on production line. Above Mahon Syphon Exhaust Stacks.

MAHON specializes in building Spray Booths that are designed to fit the product to be painted. In cooperation with your plant engineers Mahon designers will work out a Spray Booth installation to fit your exact need. It makes no difference whether you want a single booth, a battery of booths or a conveyor line installation—or whether you paint small castings or box cars, the Mahon organization is prepared to take care of you. Mahon's performance records in leading automotive plants will convince you of the wisdom and economy of a Mahon System. Get full information.

An Estimate Costs You Nothing

THE R. C. MAHON COMPANY
Detroit, Mich.

MAHON

SPRAY BOOTHS & EXHAUST STACKS

· DESIGNED FOR FIRE SAFETY ·

tain food containers a coating is often used to prevent the food from coming in contact with the metal. Such coatings must be free from lead salts and other materials that may prove harmful for this purpose. These coatings are usually called sanitary lacquers.

Bottle caps and many similar articles are coated with a so-called gold stamping lacquer, which imparts a color to the tin that gives it the appearance of brass or gold. Such lacquers are made on a varnish base and must have great flexibility and adhesion to withstand the stamping and crimping operations. Some of these finishes must also withstand special tests such as boiling water, alkali or acid solutions, etc.

Rigid Requirements

Finishing materials in this industry must be of the highest quality. They must adhere tightly to the metal, must be capable of being applied with a coating machine, must bake hard and free from "tack" in a minimum of time and must withstand crimping, stamping, drawing and similar treatment given the metal after finishing. Some concerns do decorating only, and ship the sheets to other factories for stamping. It is necessary that the finish remain elastic for some time, so it will not crack or chip during subsequent manufacturing operations.

Dependable
WOOD LACQUER
Made Since 1857
At our works—Newark, N. J.
Pioneer Lacquer Manufacturers
CHAS. COOPER & CO.
90 Worth St., New York ... Works Newark, N. J.

Conveyors Through Ovens

While the general method of coating the sheets is roughly outlined in the foregoing paragraphs, the exact equipment and methods differ in individual plants. Most of the coated work is baked in conveyor ovens, but the speed with which the material passes through these ovens, and the temperatures used vary in different plants.

Some factories use equipment which automatically coats the sheets and bakes them without the touch of human hands. In this industry, as in many others, special equipment has been developed to speed up production and to save labor, and improvements are being made all the time.

While nitro-cellulose lacquers have some use in this industry, the coatings as a whole are generally built on a varnish or an oil base. Many of the coatings are called lacquers but the materials contain no cellulose nitrate; these names were coined before the advent of nitro-cellulose lacquers.

A foreman is a man in authority, and authority is the hardest test of any man.

Freer Joins Gilbert Spruance

Harry T. Freer, formerly general manager of the Varnish & Enamel Division of the Beaver Products Co., Inc., Buffalo, N. Y., recently resigned to take the Position of Vice-President of The Gilbert Spruance Co. of Philadelphia, Pa.

Mr. Freer started in the paint business with the James B. Sipe Co., Pittsburgh, Pa., later becoming associated with Pratt & Lambert, Inc., whom he represented in the Philadelphia district for a number of years. In May 1924 he organized the Varnish & Enamel Division of the Beaver Products Co., and was successful in making the Beaver line of varnishes and enamels well known to the jobber painter and industrial trade.

"Wears Like Flint"

Superiority Pays

In the long run superiority always pays. For half a century we have been manufacturing superior finishing materials that have earned for us a most enviable reputation.

It is a notable fact that we have built up our large business of today, mainly by producing finishes that have proved their superiority in side by side critical comparisons with other manufacturers' products.

In other words we may say—"We speak loudest through our own goods."

We specialize in: Lacquers, Clear, Rubbed Effect and Colored.

And in Paragon Rubbed Effect Varnishes, Flat, Velvet, and Semi-Bright.

Your Problems are Our Business

THE CLEVELAND VARNISH COMPANY

Established 1881

3111 EAST 87th STREET CLEVELAND, OHIO, U. S. A.

Paint and Varnish Thinners

Calling attention to the uses and characteristics of volatile thinners—turpentine, naphtha, benzole, toluol and turpentine substitutes—so that finishers may be acquainted with the materials they use

By Russel W. Brandt

FOR MANY years, turpentine was looked upon as the only solvent, or thinner, which could be universally used in the paint industry and, up to the last few years, it was the "king" of all thinners.

Turpentine is produced by distilling the sap of certain species of pine trees, such as the Georgia pine and a few other long-leaf pines which grow in the southern part of the United States. The sap is collected and refined by distilling it with steam; the resulting distillate is the turpentine of commerce. This product is also known as "steam-distilled turpentine" and "gum spirits of turpentine."

In distilling turpentine a residue remains after the turpentine has been distilled over, and this residue is the well known rosin, or colophony.

Spirits of Turpentine

Turpentine has a very pleasant odor—much different than the odor of wood turpentine, which will be discussed later. It is used only to increase the spreading power and working qualities of paints and varnishes; it has no paint preserving qualities.

New or fresh turpentine has a specific gravity of .865, but that which has been exposed to the air, or is old, may have a slightly higher gravity. Its boiling point is around 350 degs. F. and it evaporates very slowly. This slow evaporation makes it highly prized for use in high grade varnishes, enamels, etc. If a few drops of pure turpentine are placed on a paper they should evaporate completely and leave absolutely no sign of their ever having been on the paper.

In the past few years, the use of turpentine in paints has diminished considerably. In many of the baking enamels, or paints which are to be baked on a metal surface, turpentine is not used at all in their manufacture nor in preparing them for use.

Wood Turpentine

For a time there was such a large production of turpentine and apparently such a limited number of pine trees which could supply the sap that the use of sawdust, stumps, etc., was started to make a wood turpentine.

Wood turpentine is produced by placing these materials in retorts and distilling them, the distillate in this case being termed wood turpentine. It has a disagreeable odor, although if it is properly refined its disageeable odor may be largely removed and its properties made to very closely resemble those of the gum spirits of turpentine, and in some instances it is very hard to distinguish between the two.

Benzine or Naphtha

One of the most important and most widely used substitutes for turpentine is the petroleum product called benzine. This is also called naphtha, petroleum spirits and mineral spirits.

This material is obtained from petroleum by distillation of the crude oil and by taking certain parts, or fractions, of the distillate which distills over. The part taken usually has a Baume gravity of about 60-degs., or perhaps as high as 63-degs. It is a colorless liquid, lighter in weight than water and has an odor not unlike that of gasoline. It is inflammable and evaporates much faster than turpentine.

Some grades of benzine have exactly the same rate of evaporation, solvent power, etc., as turpentine, and they can easily replace it in most instances without any ill effects.

The industries that use baking enamels and baking ovens for drying their painted products are probably the largest users of benzine for use in paints, and as was said before, in many cases, the paints they use have little or no turpentine in them.

Benzol or Benzene

Benzol, or benzene (do not confuse with the above *benzine* spelled with an "i" instead of an "e") is derived from coal tar by distillation. It is colorless, inflammable and has a distinctive odor. It is used to quite an extent in coal tar and other bituminous paints. Small amounts of benzol may be added to some paints that have a tendency to livere; this small addition of benzol will correct that condition and keep the paint fit for use.

It has also been found that the addition of benzol to priming paints is beneficial, as it tends to increase the strength of the bond formed between the paint and wood surfaces. Benzol is a remarkable solvent for many things and for this reason is often used in paint and varnish removers.

ZELLAC

Any

Lacquer Product that You Want

We are supplying manufacturers in hundreds of fields with any and every type of lacquer product that they need for rapid, high-grade economical finishing.

No matter how unusual your finishing requirements may be, our laboratories and plant are equipped to supply you with lacquer materials for every step of every job, from beginning to end.

Removers, cleaners, primers, fillers, sealers undercoat and top coat materials, thinners, pigmented grades in every color and finish, crackle grades,—there isn't a material known to lacquer finishing but that we've formulated it, tested it, manufactured it, applied it, and sold it. The scope of our manufacturing service is unlimited, as, indeed, it should be in an organization of exclusive lacquer makers with our background and experience. And we KEEP it so, with every modern development.

In all fact, we're prepared to cope with ANY finishing problem. Our representative will gladly bring our service to your desk, linking you direct with our laboratories. Tell us your problems. Write to-day!

Zeller Lacquer Mfg. Co., Inc.

Zeller Building

20 East 49th Street New York

Stockrooms and Offices at:

Chicago: 551 W. Lake St. ***Los Angeles:*** 786 Ceres Ave. ***San Francisco:*** 1039 Harrison St. ***Denver:*** Ormor Sales & Supply Co., 503 Fourteenth St. Distributors.
Wichita: Ormor Sales & Supply Co., 452 N. Main St. Distrib'rs.

ZELLAC

ZELLAC

#300 Finishing Lac!

Use as an undercoater

Use as a final finish

A high quality, low priced finishing material, with capacity for wide application, that fits in with today's exacting finishing requirements.

No. 300 Finishing Lac combines the qualities of shellac, lacquer and quick-drying varnish, with easy sanding features. Equally satisfactory results when sprayed, brushed or dipped.

A good material at moderate cost—Will you inspect a quart sample at our Expense?

E.T. STILLE & CO.

2343 Greenview Ave.

CHICAGO, ·· ILLINOIS

Toluol; Solvent Naphtha

Toluol is another coal tar product and is very closely related to benzol. It is colorless and is not quite as inflammable as benzol. Its use is not as great as benzol, although it is used with other materials to dissolve some gums.

Solvent naphtha also comes from coal tar. It is a colorless, light oil, boiling between 266 and 320-degs.F. It is an excellent solvent and is used quite extensively in bituminous paints and varnishes, and also in paint and varnish removers.

Turpentine Substitutes

A number of mixtures of various solvents have been patented and offered to the trade as turpentine substitutes, but great care must be taken in using or adopting them because of the nature, or formula of the paint with which they may be used. They might work fine under certain conditions while under other conditions, not far removed, they would be unsatisfactory and might cause quite a waste. If you must use a turpentine substitute or a mixture of turpentine substitutes, make sure that your paint is designed so that the materials in mind can be satisfactorily used.

Origin of Shellac

According to technical experts, pure shellac is obtained only from the Tachardia Lacca which feeds on the leaves and twigs of certain trees in India and exhudes a substance which soon encloses the entire swarm. The twig is then detached with the incrustation and heated in a bag over a charcoal fire until the gum drips from the bag. The gum is then collected on large flat stones where it hardens into cakes which

are exported from India all over the world. The U. S. imports nearly 30,000,000-lbs. of this substance annually.

Fiber Furniture Finishes

The following formulas have been developed and successfully used in obtaining certain finishes in the production of fiber furniture:

Blue Antique

American blue	2 lbs.
Black	1 lb.
Turpentine	½ gal.
Japan drier	½ gal.
Varnish	1/16 gal.
Boiled oil	1/16 gal.
Raw oil	1/16 gal.

Purple Antique

Unfading red	3 lbs.
American blue	¼ lb.
Turpentine	½ gal.
Japan drier	½ gal.
Varnish	1/16 gal.
Boiled oil	1/16 gal.
Raw oil	1/16 gal.

Green Antique

Green medium	2 lbs.
Black	1 lb.
Turpentine	½ gal.
Japan drier	½ gal.
Varnish	1/16 gal.
Boiled oil	1/16 gal.
Raw oil	1/16 gal.

Parchment

Raw sienna	5 lbs.
Burnt umber	1 lb.
Turpentine	3 pts.
Linseed oil	1 pt.
Varnish	1 pt.
Japan drier	1 pt.

Note: For ivory use ½ lb. burnt amber.

Antiquing for Cane and Upholstered Frames

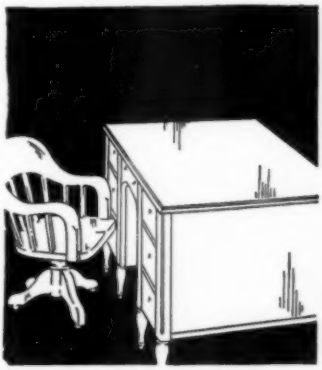
Paste (color selected)	16 lbs.
Benzine	7 gal.
Imitation boiled oil	½ gal.

Editors Note: The above is submitted by Mr. C. F. Scribner, Management Engineer, specializing in the furniture industry.

Aircraft Exposition

It is announced that the first aircraft exposition in New York state will be held in Syracuse from April 30 to May 5. The de-

the varnish for a fine finish



Doesn't mar or scratch. Not affected by water. Does not print—won't soften up under body heat. Rubs easily to a beautiful finish.

We maintain a staff of practical and technical men whose services are available at all times to the trade to aid in the solution of finishing problems. There is no charge for this service.

John Lucas & Co., Inc.

Paint and Varnish Makers Since 1849

Philadelphia

New York Pittsburgh Chicago

Boston Oakland

and local distributing points

Lucas

hard-drying seat varnish

The Progressive Finishing Foreman is using

DUBL-DRI

LAKR-ENAML

VARNISHES AND ENAMELS
SATIN—FLAT—GLOSS

This original lacquer finish dries in one to two hours, hardening sufficiently to permit packing and shipping on the following day.

A saving of about one-third to one-half is effected by adopting **DUBL-DRI.**

Eliminates offensive odors and fire hazards.

Produces a satisfactory finish from satisfied workmen, **possessing all the advantages of lacquer with none of its objections.**

Also Manufacturers of

Impervilac Brushing and Spraying Lacquers,

Satin Finish (clear) and Pigmented Lacquer Resisting Undercoaters,

High Light Pastes, Etc.

Great Lakes Varnish Works
Incorporated
2207-35 North Crawford Ave.
CHICAGO, ILL.

cision was made by officers of the state aviation conference held at Albany on March 9. Exhibits will be sent by the U. S. War and Commerce departments, as well as various airplane manufacturers.

Customers Demanding Quality Finish

Another important thing that manufacturers who finish their goods may well take note of, is that each year the public in general is becoming better acquainted with different finishes. From results of the great advertising campaigns and the fact that people are asking questions, one can readily see that their knowledge is increasing by leaps and bounds.

In view of this fact, many retail buyers appreciate the difference in a quality finish, and furniture retailers tell us that sometimes a prospective customer refuses to purchase a piece of furniture because the finish does not satisfy.

Many manufacturers were practically forced to install the pyroxylin finishing system to satisfy the demands of the trade, and now it appears they will be forced to put on a quality finish because customers are demanding it.—J. C. Hertstein, Jr.

Improved "surfacers" are now being offered for modern finishes.

A New England cutlery company, faced with declining sales and a threatened shutdown, studied consumer preferences and by the simple expedient of changing the color of the handles from black to blue, soon regained its market and averted the lay-off of men.

Devoted to—
Questions
Answers
Suggestions
Comments and
Discussions on
Specific Problems

Questions and Answers

Information Service

Every issue of *Industrial Finishing* contains a wealth of practical information on various subjects of interest to users of finishes and finishing equipment, but from time to time new problems and questions arise, which demand prompt and authentic information. *Industrial Finishing* is in position to service inquiries, and the editor invites all individuals and concerns in the industry to make known their wants. Every effort will be made to supply the information desired, at no cost to you.

Questions are invited in regard to:

Finishing-room troubles or problems;
Where to obtain certain materials, supplies or equipment;
What methods or materials to use for certain results.

Additional comments or suggestions regarding questions, answers or articles appearing in this section, are invited.

A Lacquer Finish That Has Stood the Test

M. & W. Co. 1876

M & W White Refrigerator Lacquer Enamel
has been adopted for the following

Reasons

No. 1—**BEAUTY OF FINISH.** It resembles Porcelain in color and lustre.
No. 2—**APPLICATION DIFFICULTIES** are minimized.
No. 3—**TOUGHNESS and DURABILITY.**
No. 4—**EASE** of cleaning after assembly.
No. 5—Does not **CHIP** where drilling is necessary.
No. 6—Has been built upon many years of **EXPERIENCE** and Research in the Manufacture of Lacquers and Enamels for finishing Metal and Wood.
No. 7—Has been proven in actual large volume **PRODUCTION** and has withstood the most severe and critical tests.

Spray two coats over M & W Lacquer Primer or M & W Oil Base Primer to produce a LASTING, BEAUTIFUL FINISH.

Available in any required color.

MAAS & WALDSTEIN CO.
METAL & WOOD LACQUERS AND ENAMELS

45 JOHN ST., NEW YORK
WORKS—NEWARK, N. J.

CHICAGO OFFICE AND WAREHOUSE
1115 Washington Blvd. West

LOS ANGELES OFFICE AND WAREHOUSE
1212 Venice Blvd., Los Angeles, Cal.

Questions and Answers

Finish Smoking Stands

We are very much interested at this time in getting full information as to the most economical way of handling and finishing smoking stands, which are very competitive and low priced. Can you tell us the method usually employed, whether dip or spray, paint or lacquer is generally used, and what is the usual method of handling it.—B. D. Co.

The best way to finish such articles is with a spray gun as there is too much waste in the dipping tank. This method is the cheapest and fastest way.—Advance Paint Co.

Brass Plated Iron Lacquered —It "Spots"

Would like to know the cause of dark spotting-out on brass-plated cast-iron castings which we are now having trouble with. The castings are plated and cleaned in a cleaning compound and rinsed in hot water and dried in sawdust. After they are lacquered with clear lacquer they start spotting-out in from six to ten hours. We experience no trouble on the brass-plated cold-rolled steel after it is lacquered. We have come to the conclusion that the cause must be in the plating. Any information on this subject would be greatly appreciated.—E. W. C. Co.

In a similar case in Philadelphia the fault was found to be partly due to the plated work not being thoroughly clean, and partly due to the particular lacquer used, the same lacquer working satisfactory on brass sheets.

The fact that you have no trouble on your brass-plated cold-rolled steel, plated in the same manner, indicates that possibly the castings may be at fault, for they would not be as easy to clean as the rolled sheets.—Hilo Varnish Corporation.

Mahogany and Walnut Finish on Birch

Request that you furnish us information and literature on how to get a satisfactory dark mahogany and walunt finish on birch end tables and novelty furniture that we are manufacturing.

At the present time, we are spraying a spirit stain followed by a coat of shellac, with a light sanding, and a coat of flat lacquer, but are not getting the results desired. We are using the best of materials and a pressure of 50 to 70-lbs.

The line that we are manufacturing is highly competitive, therefore we wish to avoid rubbing if possible, but it seems that it may be possible that we will have to do so on the tops. —L. I. R. Co.

You do not say in what way the results you are getting are unsatisfactory, so it is difficult to give you definite advice and instructions. If the colors you are getting are not satisfactory, any of the paint, varnish, or lacquer manufacturers who advertise in INDUSTRIAL FINISHING can aid you in obtaining the proper color effects. Likewise, these finishing

AEROLAC

A Nitrocellulose Compound

Has Good Odor
Will reduce 50%
Flows freely
Sands easily

Use as a wash coat
Use as a prime coat
Use as a last coat
Price Right!

OUR GUARANTEE
Send for five gallons — If not as we claim, return it.

Jamestown Wood Finishing Co.
Jamestown, N. Y.

STAINS FILLERS J C W F PAINTS

specialists will be glad to aid you in producing the right kind of finished surface.

In general, I would say that a portion of your trouble undoubtedly lies in the use of a spirit stain. Spirit stains are dissolved in alcohol, which is one of the principal ingredients of liquid shellac. Consequently, the use of shellac over spirit stain would probably result in considerable bleeding of the stain into the shellac coat. This would make the color unsatisfactory and also promote brittleness. The solvents in lacquer also dissolve spirit stains and would tend to bleed the stain into the lacquer coats.

Although the materials you are using may be of high quality individually, they may not be well suited to each other. I strongly recommend that you submit your problem to the practical service department of one or more of the lacquer manufacturers of finishing materials and feel sure you will be able to find a very practical and satisfactory solution.—R. L. Masterson.

Why Varnish Chips?

Referring to the question by I. L., as published in March issue, page 92, we wonder whether the varnish is coming off the shellac, or is the shellac coming off the wood?

It may be that the tablespoonful of dryer to a quart of varnish makes the varnish too brittle.

We suggest you put side by side on a piece of clean glass, some of the white shellac and some of the varnish at spraying consistency, and some of the varnish with the dryer in it. Let the plates stand in a vertical position and after 24 hours examine the

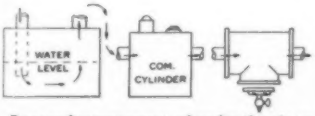
finish for hardness, and again after 48 hours.

It may be that your re-coating schedule is such that too brittle a varnish is used.—Hilo Varnish Corporation.

Cleaning Compressed Air

In an issue of INDUSTRIAL FINISHING last fall (Oct., page 9 and Nov., page 16) one of your correspondents (Mr. R. B. Prentice) went on to explain that a reserve tank was not necessary close to the compressor as has been contended. I am of the same belief, after a good deal of experimental work in connection with a compressor.

I am enclosing a rough sketch of my interpretation of Mr. Prentice's advice as to the elimination



Proposed arrangement whereby the air to enter compressor is first drawn through water container at left, and, after leaving the compressor, the air is forced through a filter at right.

of a large air receiver, and have shown some ideas of my own in connection.

First, with regard to filtering the air before it enters the compressor: It is my belief that a solid body of water will remove free moisture from the air as well as any other impurities—dust, etc.—and if this is correct, my arrangement certainly would do the work. Otherwise, of course, it would be N. G. What is your idea of my theory in this regard?

Secondly: The coil I show at the right is comprised of a 6-in. fitting (a pipe T) with a 6-in. plug in the bottom and in which is fitted a petcock for frequent draining. The plug is removable

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and used as an opening to insert freshly cleaned cotton waste every day. This waste collects much free oil and moisture and is prevented from blowing through by a perforated plate at both the 2-in. inlet and outlet. This portion of my contrivance has well shown its worth, and I can recommend it to anyone.

I now propose to have a small galvanized tank built and fitted pretty close around this coil and soldered to the 6-in. coil or receiver. I would then have my water supply pipe enter this outer tank, and an outlet for same to lead to the water-cooled compressor. It is my belief that this way of water-jacketing the receiver would cause a very substantial condensation quickly and at the same time hardly cause the water to be too hot to cool the compressor efficiently.

In making this so-called water jacket for the receiver, it is my idea to still arrange to keep the plug and petcock removable for draining and for the replacement of clean dry waste frequently. You may object to galvanized iron not being heavy enough to hold city water pressure, but there will be little pressure, as water will be admitted by a valve but the outlet for the water will be free. Like all compressor operators, I am interested in this proposition and will be glad to have your comment and would be pleased to have you submit this to Mr. Prentice also.—Mason Yeager.

The passage of air through water does not necessarily remove the dust from the air, owing to the fact that air is drawn through such an arrangement as shown in big bubbles, or slugs, and comparatively little of the air would

actually make contact with the water.

I further believe that the reduction of the atmospheric pressure to such an extent in the intake line, as is entailed in this apparatus, would be seriously detrimental to the efficiency of the compressor. A third objection would be the liability of actually injecting water into the air stream by the whipping of the water, occasioned by such violent bubbling as would likely occur.

As to the separator described by Mr. Yeager and at right in the drawing it seems to me that this particular form of separator would be troublesome for several reasons. Lint from the waste, used as the separator element, would foul the screens and be liable to work through the whole system.

The fineness of the waste would conduce to its becoming permanently loaded very quickly because of the "wicking" action of the waste upon the trapped moisture. A suitable element should free itself of moisture. It is questionable whether a better element than fine, sharp, quartz gravel, can be found for separators.

It would further seem impractical to combine, in one unit, the condensing element which requires a great deal of surface in contact with both the air and the cooling water, and the separator element which is perhaps more efficient when the velocity of the air through it is relatively great. —R. B. Prentice.

Art and utility have joined hands in the universal effort to popularize the employment of sprightlier colors.

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FOR a finish that has life and sparkle, include at least one coat of Du-Pros Shellac. Du-Pros adds to the depth and lustre and magnifies every fine detail of the grain. Let Du-Pros Shellac prolong the life of your fine finishes through its ability to prevent bleeding, sinking or clouding. It is effective as a wash coat, sealer or body coat under other finishes, and as a complete finish in itself. Du-Pros resists moisture, extremes of temperature and hard wear.

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Foreman of a Duco Shop in New York (address furnished) says he cannot do a good Polishing Job if he has to draw a big awkward motor around, beside the danger of its falling over against the car.

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is not a converted sander but a high-grade low-speed tool especially designed and built for its work by an organization skilled and trained in lacquer refinishing and familiar with all its griefs and hazards.

Weight only 7 pounds. Handy to carry around the car and reach all the hard-to-get-at places. Motor runs all day without overheating.

15 feet of soft rubber cord that will not injure any polished surface by contact.

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Early Use Of Varnish

Clear varnish seems to have had its origin in Egypt, though not as early as pigmented coatings. Many of the Egyptian mummy cases, of a more modern time than that of Tut-Ankh-Amen, are coated with a sort of clear varnish which is, even to this day, wonderfully free from cracks. This coating was very roughly applied, apparently with some sort of a knife, while the varnish was hot.

In fact, it was not until the middle ages that varnishes were thinned to a consistency to be applied cold. Up until this time varnishes were made almost entirely of resin and oil and were applied while still warm, by being smeared on with the hands.

At about the same time that varnishes were first being made in Egypt, another type of transparent coating was being produced in Japan, China, Korea and other Asiatic lands. These were so-called lacquers, which are made of gun cotton solutions and other ingredients entirely unknown to the ancients.

The first use of varnish, as made similar to finishes known by that name today, appears to be for the protection of paintings made by famous artists three or four centuries before Christ. Its use in this was rather limited, however, and it was not until the middle ages that it came into more common use—first in Germany and then in other civilized countries. The first directions for making linseed oil varnish are said to have been published in the twelfth century.

In the Sixteenth Century, with the opening up of new ocean lanes of commerce, shellac became known to the more civilized

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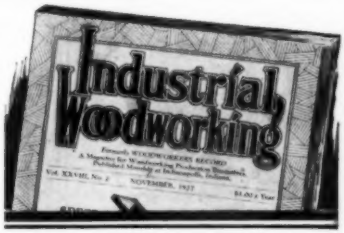

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Management, production superintendents, foremen, production and maintenance engineers follow it closely each month for the latest information on woodworking production problems, the new machines and improved methods, to cope with present-day competition.

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SPEED in spraying equipment not only means labor and money saved, but prompt deliveries, less crowded floor space and a lesser investment in material in process.

Finishing foremen, who take pride in their production records, will want to investigate the Milburn record-making spray equipment.

Exactingly tested and standardized by leading furniture, automobile and industrial manufacturers and Government Departments.

Write for Catalog

THE ALEXANDER MILBURN CO.

Baltimore, Md.

countries, and spirit varnishes, consisting essentially of shellac dissolved in various solvents, were made available for the first time.

Even today shellac dissolved in denatured ethyl alcohol is unequaled for certain purposes, although, of late years a great many so-called substitutes made from other resins have been introduced into the trade because of the ever increasing scarcity of shellac.—J. F. M.

Skill in free-hand striping is still in demand.

Newly Developed Respirator

Pulmosan Safety Equipment Corporation announces a newly developed chemical cartridge respirator which, according to information submitted, is a simple device consisting of a prepared container packed with ingredients that neutralize and clean all the fumes arising from paint spraying.

The body construction is of brass, heavily nickel plated (see illustration) and fitted with non-inflated cushion, threaded connections for attaching chemical cartridge, positive exhalation valve and adjustable double strap.

The cartridge is made of a double texture filter medium and chemical ingredients, scientifically packed to give satisfactory results and lasting qualities. A cartridge will last from 48 to 72 hours in service, and does not deteriorate when not in use.

Baked White Enamel Jobs

Why white baked enamel jobs must be handled altogether differently than, and separately from, black baked enamel work, and what precautions to take to insure satisfactory results

By Fred Mannhardt

WE HAVE read much in INDUSTRIAL FINISHING about black baking enamel. It would seem that nearly all colors of enamel were run through in the same or almost the same manner, but there is as much difference in running white and black through, as there is day and night. Note: white and black are not classed as colors.

To begin with, the white job is or should be started differently than a black job. Let us commence with cleaning the metal: Supposing the metal surfaces are washed in gasoline, dried off, dusted, and given a coat of black bake; it's O. K., but try the same thing on white enamel and it's a 100 to one shot that spots will show through the white after the job is baked. This will often times occur, even when the finish is not baked.

Cleaning the Metal

For a white enameling job, first clean off all grease with gasoline or benzine. If it is a large article, the surface may be wiped off with a dry rag after it is cleaned in gasoline. Small articles can be put in a wire mesh basket and dipped into the gasoline.

When a lot of work is run through, the gasoline will become greasy. When this happens, throw away the greasy gasoline and use clean gasoline. A drip pan can be arranged so as to allow gasoline to flow back into the tank—this for economy and safety. Too much stress cannot be laid on the care this operation should have.

Ventilation

The main thing is to guard against fire; also the worker should look out that he is not in danger of being overcome by the fumes. Keep away from lights, etc., and be sure to have good ventilation. One window open at the top and another at the bottom gives good circulation of the air; not only this, but the factory inspector is liable to give you plenty of trouble.

After the gasoline on cleaned metal surfaces has evaporated, place the articles in the oven, and bake as hard as they will stand without warping or melting the solder. If you are compelled to bake at a lower heat on this account, continue baking for a longer time. The idea is to burn off all grease left by the gasoline. After this operation is finished, sandpaper thoroughly, dust off and apply the priming coat. Bake or air-dry as you please, then sandpaper, dust off, and putty the holes. (Puttying can be done before primer is applied to metal surface, if you so wish.)

How many coats to give it, I cannot tell you; that depends on condition of metal, cost of job, etc. But before the last coat is applied, water-rub the surface with fine grade pumice stone, wash off with sponge and dry with chamois. Be sure the surface is perfectly dry before recoating. Get your enamel all set

to use before cleaning the surface preparatory to giving the final coat; and where possible, keep every one out of the room who has no business there.

Oven Management

Try to keep one of your ovens for white work only, but, where this is impossible, leave the door open a trifle while baking white; otherwise you will discolor your white from the fumes that spread in an oven that has been used for black or colors. After a charge has been baked, and the heat is turned off, do not open the oven door until the work is cool. Two real important reasons there are for this.

When your metal is hot it expands; when cool it contracts. This process of expanding and contracting should occur slowly; otherwise your work will check. You may not notice it for some time—not for perhaps several weeks—but it will do it nevertheless. The higher the temperature a piece of work is baked, the worse it will be.

Treat the entire process carefully—that is in a sensible manner—and you will keep out of a lot of trouble.

Another reason for cooling the work with oven doors closed is, when the finish on a piece of metal work is baked, the surface often remains soft enough, until cooled, to permit dust to adhere to it. You may be in a hurry to deliver a job, and all that, but suppose through rushing it you are compelled to do it over. How far then are you ahead? I've done the same thing myself, and probably will continue to do it, but not of my own choosing.

Use Quality Materials

Another thing in white enameling. Do not use an inferior grade of finishing material, for if ever you are going to get in wrong it will be on white work. Before you buy, have a salesman give you a demonstration, or try it out yourself. Be sure to have your ground work thoroughly solid before you apply the enamel. To give your job a rounder and fuller appearance, better give it two coats of your enamel over the ground work instead of one. After the articles have been completely finished and are dry, wrap each one in good clean paper, preferably tissue paper, before delivering.

What Shellac to Use

White shellac is conceded by many finishers, to be better for furniture work than orange shellac because of its paler color, but for certain purposes, where the tone of the finish needs to be changed slightly, it is sometimes advisable to use orange shellac. The main thing is that the shellac should be pure and unadulterated. There are a number of shellac houses who can furnish pure shellac.—R. L. M.

We all know that there is a larger percentage of new homes being built today which are being painted than there was 15 or 20 years ago, when so many houses were never painted. Colors also are rapidly awakening the consciousness of the buying public to the painting habit. The advent of brushing lacquers, which has awakened the market of non-paint users, is another contributing factor which augurs well for the future of the paint industry. We are extremely bullish on the future of the paint market.

Japan Stripped in 1/4 to 1/2 former time

OPERATION — Stripping black japan, baked at 400° F., from brass and steel punchings.

FORMER METHOD — Used caustic soda—1½ to 2 lbs. per gallon of water. Stripped in from 2 to 24 hours.

PRESENT METHOD—Use INTERNATIONAL No. 2B—9 to 10 oz. per gallon of water. Strips in from ½ to 12 hours maximum.

Are you interested in faster and cheaper japan stripping?

If so write me for a trial lot of "2B."

Internationally yours
John Bright

INTERNATIONAL CHEMICAL CO.
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"For the past three years, we have been devoting considerable of our time and money in exhaustive engineering research for a better and safer way of heating japan and enamel baking ovens. If you are at all familiar with the art of baking japan or enamel finishes you have noticed the great similarity of heating methods employed by all oven builders. However, what probably is not so well known to you is that these ovens (ours included) are explosive machines in disguise, frequently exploding or catching fire with disastrous and expensive results."—

A. E. Maehler

Baking Ovens Made Safe—No More Explosions

General Manager of Paul Maehler Co. reviews numerous oven explosions, points out causes and explains the new recirculating system which has been developed to eliminate the danger of bake-oven explosions

By A. E. Maehler

THOSE who have never experienced an oven explosion nor witnessed its after-effects can little appreciate the havoc that can be created, or the damage that can be done to life and property by such an innocent looking piece of industrial equipment.

Explosions in japan ovens became so frequent and so disastrous as to cause the Inspection Department of the Associated Factory Mutual Fire Insurance Companies, dating back to 1925, to make an exhaustive study of japanning processes, resulting in voluminous recommendations. Their findings were summarized in these words:

"The exact cause of these explosions is somewhat in doubt; however, it is a fact that vapors of inflammable liquids cannot explode when mixed with air and present in percentages less than a definite amount (commonly referred to as the 'lower explosive limit'). Consequently the fundamental causes of all such disasters can be attributed, without error, to insufficient ventilation."

In spite of the fact that ovens of every description are fitted with relief hatches or blow-off caps, under the assumption that such hatches relieve compression and thus prevent disaster, these explosions have continued with, at times, freakish results.

Typical Explosions

In one case the entire top of the oven was intact and the entire bottom of the oven blown outward 12-in. In another case the hatches held, but the doors at one end were blown open. And again, the relief hatches held but the entire top side-wall of the oven was blown outward and doors at one end blown open.

These freak explosions are caused by the formation of gas pockets inside the oven which, in

Boston Industrial
Baking Enamels

These Enamels, which are made in a variety of colors, are intended to bake at a temperature of 250 degrees in from four to five hours. Thirty minutes after baking, they may be packed for shipment. They give a remarkably hard, durable finish; are tough and pliable and will give perfect satisfaction whether used on wood or metal.

There is another feature in connection with these Industrial Baking Enamels which is worthy of consideration and that is the fact that they are washable. Dirt can be removed from them with a damp cloth and the Enamels will shine with their original lustre.

On wood they can be used over our regular Fillers which are inexpensive, and on metal they can be used without any Filler at all, giving a solid, durable coating with one or two coats. They are waterproof and will resist the most severe handling.

If you are interested in these Enamels, we will be very glad to furnish you samples and give you instructions how to use them.

Boston Varnish Company

49 Everett Station **Boston, Mass.**

exploding, exert their maximum force in an atom of time.

Of course all ovens are not so dangerous and all explosions are not so disastrous; some ovens have been observed in which at times the doors could be seen to billow outward and open slightly, indicating an explosive tendency not up to maximum capacity because a maximum compression was not quite present. Other ovens have been observed for 2000 and 3000 consecutive bakes, without a sign of fire or explosive condition.

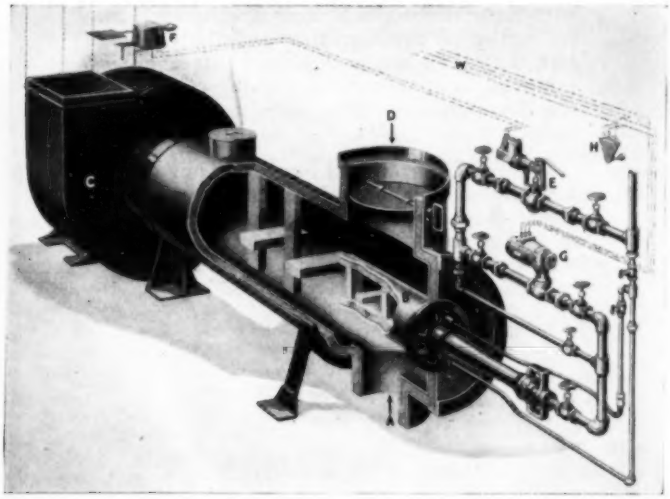
When a "flash" or oven fire occurs, resulting in destruction of all the applied coating of the load in bake, it is apparent that the oven atmosphere is so "rich" that an explosion is, fortunately, impossible, as is the case when the oven atmosphere mixture is "lean."

Typical Losses

As to the monetary loss which results from these disasters, the following few cases taken from a record indicate the extent of the losses, not to mention the losses resulting from inability to produce orders, and time required to rebuild the plant:

S 13446—Springs which had been dipped in japan, then naphtha, were charged into the oven which was too hot. An explosion of fumes occurred. Loss $18,000.

S 19653—An explosion occurred in a japan oven owing to the fact that



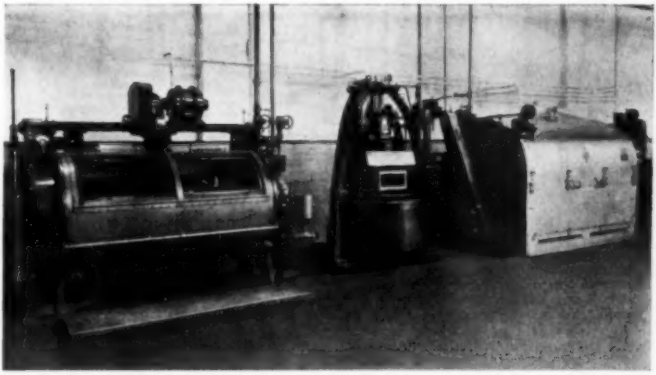
A close-up, with cut-away section of typical combination heating and recirculating apparatus.

A—Fresh air intake. B—Gas burner. C—Blower or fan.
D—Recirculation inlet for returned air and explosive vapors from oven.
E—Motor valve with manual turn-on; automatically closes for failure of current or stopping of the fan.
F—Fan relay releases fuel valve when air passes through delivery duct; closes and locks valves when fan is shut down.
G—Temperature control motor valve. H—Thermostat.
W—Wiring to electric door switch. Opening doors shuts off gas by opening temperature-control valve circuit and automatically lights gas.

Now they use their rubbing waste over again!

"We are using your equipment in washing and drying our rubbing waste and are thoroughly pleased with the results. We feel that we save money in the year's run by working this product twice, where we formerly used it only once and discarded it."

—J. D. Bassett Manufacturing Co., Inc.,
Bassett, Va.



This "American" equipment makes it possible to reclaim soiled wiping rags and waste and use them again and again. Have us tell you about the saving.

YOU'LL be enthusiastic, too, when you install *your* "American" equipment. We have a man in your neighborhood who will be glad to talk to you. He's a specialist in industrial laundry practices, and he'll show you how to cut your wiping rag costs to the bone. No obligation—just write.

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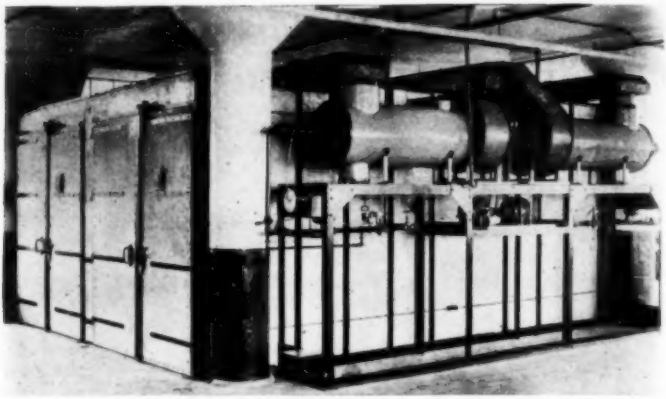

Two ovens equipped with new heating and recirculating apparatus which shows up clearly in the foreground.

work in process had been placed in the oven immediately after dipping. Loss $4,000.

H 32210—Fumes from a recently filled japanning oven were ignited in a common vent from the exhaust stack of an adjoining oven, flashing back and igniting fresh japanned stock. Loss $6,700.

H 29540—A short circuit in one of the heating coils of an oven ignited vapors in the oven. The fire spread rapidly and caused a loss of $84,000.

S 31470—An oven, having been under daily operation and baked seven lots of work, exploded immediately after the eighth charge was loaded. The damage to oven, skylight, and water damage to stock amounted to $10,728.

H 41565—An oven, having baked 3422 consecutive charges of same characteristics of load, exploded immediately after the 3,423rd charge was loaded, completely demolishing the enameling department of the plant with a loss of $42,000.

The causes for oven fires and explosions have existed from the first time a load of japanned or enameled metal was baked in a heated chamber, and the trend toward faster, quicker production at lower costs per bake has increased and intensified the hazard accordingly.

The largest cost item of operating industrial ovens has been heat. Obviously, the more heated air allowed to escape to outside atmosphere from the oven interior, carrying with it the explosive, inflammable fumes and vapors of drying thinners, the more cold air must be heated to maintain baking temperature in the oven.

Cut down the amount of air to be heated and you cut down heating costs. As oven builders and operators cut down ventilation they increased fire and explosion hazards. Every oven builder was in the same boat, all trying to do the same thing—all getting the same disastrous results.

Signal for Action

The climax for the Paul Maehler Company came one day in 1926 when two of their installations exploded within a few hours of each other—one in Indianapolis, the other in Rochester—with a total loss of about $60,000. It was time, we decided, to take drastic steps to eliminate the hazard of fire and explosions from our ovens—and all japanning ovens if possible—for all time including the human equation.

FOR METAL, WOOD, COMPOSITION, REED, ETC.

Armitage ARMORLAC LACQUER SYSTEM

A DEPENDABLE lacquer system of finishing, backed by one of the oldest paint and lacquer manufacturers in the United States.

With a background of mature experience in the development of lacquers, we number many leading industrial concerns as users of ARMORLAC, among them several well-known car manufacturers in the medium priced field.

To those who feel the urge to conquer new fields through improvement of their products, we have an interesting story to tell—of ARMORLAC, its everlasting dependability, lustrous beauty, yet on a cost basis comparable with varnish finishing.

Just give full details of your products when writing us.

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Established 1876
Newark, New Jersey

MANUFACTURERS SINCE 1876

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is now being used by many who, heretofore, have thought it *necessary* to cut their own.

CADILLAC SHELLAC COMPANY

Incorporated

Ferndale (DETROIT) Michigan

EASY NOW TO REPAIR DAMAGED FINISHES

Permanent repairs are easily and quickly made with Campbell's Stick Shellac. No use to lower prices because of damage—or to incur big expense of refinishing.

CAMPBELL'S STICK SHELLAC

Campbell's Stick Shellac easily restores scarred and scratched finishes to perfect condition. It is melted into the hole, dent or scratch and then rubbed down and polished. It is truly an ideal way to economically repair damaged finishes.

UNIVERSALLY USED

A color card of Campbell's Stick Shellac will be sent free to anyone upon request. Shows actual samples of the Shellac and the range of 54 different colors. Write for one today.

The M. L. CAMPBELL CO.

1007 W. 8th St. Kansas City, Mo.

In collaboration with the users of these and other exploded ovens and the Associated Factory Mutual Insurance Company Inspection Department, steps were taken to definitely eliminate the cause of oven fires and explosions.

We knew that "the fundamental cause of all such disasters can be attributed, without error, to insufficient ventilation."

We knew that to provide a sufficient volume of ventilation to dilute the inflammable vapors to the point of absolute safety would make heating costs prohibitive.

We knew that the danger period was the first 15 or 20 minutes of the baking cycles, during the heating-up period of the work being processed, when the oven atmosphere was such that any ignition source, such as a spark or hot surface spots in oven radiators could set it off with disastrous and expensive results.

Therefore, the problem was to destroy the inflammable vapors as rapidly as they were driven off by the baking process, without increasing the rate of ventilation—and to decrease it, if possible, without wasting the heat in the oven.

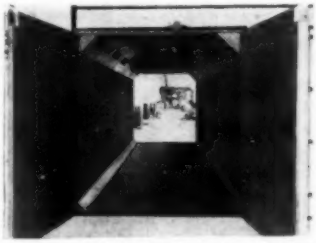
Modern Recirculation System

Finally we found an external-fired gas heater, having the desirable characteristics of economical heating and safety in handling combustible vapors by the process of elimination. A heater built and patented by The Industrial Gas Engineering Co., permitted recirculation of oven atmosphere at oven temperature, through the burner, in direct contact with the burner flame, and back to the oven.

By this new system of recirculated, convected heat, oven air is distributed and circulated through

slotted ducts, one connected to the exhaust side of a direct driven blower fan and another similar duct connected to the intake side of the fan through the burner. Ovens heated by this system offer an absolutely clean interior. There are no heating elements, radiators, or projections inside the oven.

A natural draft outlet or stack is provided of a capacity in relation to the oven and the fan, to develop a water gauge pressure



Note the clear space within oven interior

within the oven of ⅛ to ½-in., thus forcing equal temperature to all parts of the oven, as well as making impossible the formation of gas pockets or hot spots.

This heating system is adaptable to all types of japan and drying ovens, and to foundry core ovens. It offers new economies in heating costs, first, because all air is brought into direct contact with the burner flame through the heater; second, because of the return of oven air to the heater at oven temperature; and third, because ventilation volume has been reduced to an extreme minimum.

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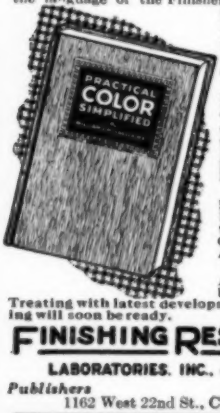

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designed to meet practically every contingency that can develop in the operation of the oven.

The new system of heating accomplishes what otherwise would have to be done by increased admission of fresh air or greatly increased ventilation volume; that is, it destroys by incineration the explosive, inflammable vapors of volatile thinners as rapidly as they are thrown off by the work in process, thereby constantly purifying the oven atmosphere. The atmosphere is clean and at its minimum stage has 15 percent of oxygen, no monoxide, 4 percent dioxide and 81 percent nitrogen content.

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The Disappearing Trick

A set of automobile fenders were recently sent to an auto paint shop for refinishing. The painter immediately placed them in a tank of strong potash cleaning solution. On returning a few hours later, to remove the fenders from the tank, he found nothing remained but the small brass trimmings. The fenders were aluminum and had completely dissolved.—C. Joseph.

Cleaning Metals to be Bake Finished

That article "A High Class Baked Enamel Finish on Cast Metals," as run in February issue, was certainly a mighty fine one. However, on page 106, I see the author states that oil and grease can be removed with gasoline but "caustic soda is being used to a greater extent as a cleaner today in production work." The author furthermore goes on to say that it is absolutely necessary to remove all trace of caustic before applying enamel, since if any caustic is left on the work it will cause peeling and blistering.

Mr. C. S. is absolutely correct when he says this. That is why the chemical company with which I am connected has perfected special materials for cleaning before japanning and enameling. These products are compounded so that they are "free rinsers," that is after the material is removed from a bath of the cleaner, no alkali remains on the work. In this way there can never be any danger of a caustic film remaining, which would cause peeling and blistering.

Today we are strongly stressing "a chemically clean surface" before japanning and enameling. Today, the enameling foreman, providing he uses the proper scientific cleaner, can be sure that he can remove all grease and oil rapidly, thoroughly and economically, and at the same time not leave any dangerous caustic film on the metal, that later on, could cause trouble to the japan.

Furthermore, C. S. states that caustic soda is not adapted for cleaning aluminum, but states that aluminum is to be cleaned with a sand blast. It is interesting to know that our company has perfected several materials that will

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remove oil and grease from aluminum and that will not tarnish or darken the aluminum. Aluminum can be cleaned with a scientific chemical cleaner, thus assuring quality production.

It should be pointed out that concerns that have specialized in certain problems incident to finishing, such as preparing the metal surface for the finish, are in most cases admirably suited to giving accurate advice on just the correct material to use to get ideal results with the most modern methods at lower cost.—D. J. Benoliel, International Chemical Co.

Treating Dark Spots

Here, I believe, is a good idea to pass along to furniture finishers for coloring dark spots to match lighter finishes, for example, spots such as stain drops or defects in the wood which make the finish too dark.

Take a little red lead and mix with thin shellac or lacquer. With this, use a little Spirit Black or Bismarck Brown and you can get almost any color desired. Use a pencil brush for applying and after a few minutes you can give the whole surface a coat of lacquer or, if you wish, you can just French polish it and get a satisfactory job.—M. C. N.

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